STATE OF ARIZONA

RECYCLING PROGRAM ANNUAL REPORT

Report for Fiscal Year 1998
July 1, 1997 - June 30, 1998
Submitted December 1, 1998

Prepared by the
Arizona Department of Environmental Quality
Recycling Program

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Recycle Arizona

Prepared by the
Arizona Department of Environmental Quality
Waste Programs Division
Solid Waste Section
Recycling & Data Management Unit
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A C K N O W L E D G M E N T S

The 1990 Arizona Solid Waste Recycling Act through A.R.S. §49-837.D., established an advisory committee to advise the director of Arizona Department of Environmental Quality (ADEQ) on the use of monies in the recycling fund. The nine members of this committee are appointed by the director. The Arizona Recycling Advisory Committee consists of two representatives from private solid waste haulers, two representatives from private solid waste recycling businesses, four representatives from political subdivisions which have implemented recycling and source reduction programs, at least one of whom resides in a county having a population of fewer than five hundred thousand persons, and one representative of the general public.

We would like to acknowledge the support, commitment and hard work of the following Arizona Recycling Advisory Committee, who have provided invaluable direction to the director and the Recycling Program staff.

THE FISCAL YEAR 1998 ARIZONA RECYCLING ADVISORY COMMITTEE

Mr. Neil A. Markowitz
1998 Chairperson
Executive Director
Environmental Education Exchange
Tucson, AZ

Mr. Joseph Klimoski
1998 Vice Chairperson
Operation Manager
Friedman Recycling Company
Phoenix, AZ

Mr. Robert Jackson, P.E.
Past Chairperson (1997)
Public Works Director
City of Casa Grande
Casa Grande, AZ

Mr. Patrick J. Bell
Division Manager
City of Sierra Vista
Sierra Vista, AZ

Mr. Patrick Bourque
General Manager
Waste Management
Kingman, AZ

Mr. Brian Conway
General Manager
River Cities Waste Service
Lake Havasu City, AZ

Ms. Mary Dahl, Director
Community Development Director
Department of Community Development
La Paz, County
Parker, AZ

Mr. Michael W. Hoyt
Field Operations Director
City of Glendale
Glendale, AZ

Mr. Mark Wingfield
Plant Manager
Poly Tek Southwest
Queen Creek, AZ

THE ARIZONA RECYCLING PROGRAM

The 1990 Arizona Solid Waste Recycling Act established the Arizona Recycling Program within ADEQ. The Recycling Program is funded by landfill disposal fees. Outlined in A.R.S.§49-837, Program responsibilities include distribution and administration of funding for the Waste Reduction Assistance (WRA) Grants and the Waste Reduction Initiative Through Education (WRITE) Grants. In addition, the Recycling Program conducts public education, technical assistance and outreach events. The Program also partnered with Arizona Department of Commerce to attract recycling-related companies to the state, keeping the economic benefits of recycling in Arizona rather than shipping the commodities and losing the benefits to other states.

The Recycling Program staff assists Arizona governmental jurisdictions for profit and non-profit organizations. The Program team members consist of nine uniquely qualified individuals from ADEQ and a representative from Arizona Department of Commerce.

Tammy Shreeve is the manager of the Recycling and Database Management Unit and is responsible for the administrative functions of the program. Tammy can be contacted by E-mail at shreeve.tam@ev.state.az.us or at (602) 207-4171.

David Janke is the recycling database coordinator. He oversees the collection and compilation of statistical data pertaining to solid waste recycling and disposal. David also conducts research to determine recycling trends and the status of past recycling grant programs. He can be contacted by E-mail at janke.david@ev.state.az.us or at (602) 207-4173.

Cara DelVecchio is the recycling education project coordinator. Cara oversees the WRITE recycling education grants and promotional projects. Cara can be contacted by E-mail at delvecchio.cara@ev.state.az.us or at (602) 207-4865.

During fiscal year 1998, Chris Cook was the Waste Reduction Assistance Grant and Household Hazardous Waste Grants coordinator. Chris is no longer with the Recycling Program Staff.

Travis Saladino is the recycling program specialist. Travis is a member of the program's statistical analysis team and a project coordinator. Travis can be contacted by E-mail at saladino.travis@ev.state.az.us or at (602) 207-4174.

Nancy Bell is the research and statistical analyst. She researches and records data in order to provide analyses. Nancy can be contacted by E-mail at bell.nancy@ev.state.az.us or at (602) 207-4134.

Tonya Rushlow is the data management processor and is responsible for the recycling financial and recycling address list databases. She is also responsible for the Solid Waste Tracking System (SWATS) database and providing needed database reports. Tonya can be contacted by E-mail at rushlow.tonya@ev.state.az.us or at (602) 207-4667.

Pat Fizer is the program secretary and can be contacted for general recycling information by E-mail at fizer.patricia@ev.state.az.us or at (602) 207-4133.

The Recycling Program staff can also be reached toll free in Arizona at 1-800-234-5677 and by using the last four digits of the phone numbers listed as the extension.

Seth Hudson is the recycling market development manager at the Arizona Department of Commerce. Seth is responsible for the administrative duties of the program. Seth can be contacted by E-mail at sethh@ep.state.az.us or at 1-800-528-8421.

I. EXECUTIVE SUMMARY

The Arizona Recycling Program for the purposes of this report means the program prepared and adopted by this state and approved by the Arizona Department of Environmental Quality to implement Arizona Revised Statute §49-831. The Arizona Solid Waste Recycling Statute became effective in September 1990. The Statute created a multifaceted solid waste reduction program which requires specific types of information and recommendations to be included in the Arizona Recycling Program's annual report. These topics discussed in the annual report are: 1) waste stream analysis, 2) recycling volumes and programs, 3) costs and revenues, 4) recycling grants, 5) public education, 6) recycling market development, 7) used motor oil and 8) recycling opportunities, impediments and disincentives. This report covers the Fiscal Year July 1, 1997 to June 30, 1998 (Fiscal Year 1998).

The information in this report concerning the public sector recycling efforts was gathered through the annual recycling and waste reduction questionnaire which is distributed to all local jurisdictions within the state. A private sector survey, conducted in cooperation with the Arizona Department of Commerce's Recycling Market Development Program, was distributed to all known private recycling companies, non-profit organizations, and landfills. As of the publication date of this report, data from the private sector had not been fully received and compiled. It is anticipated that the private sector information will be completed in early 1999. Check the program's website at (www.adeq.state.az.us/waste/solid/recycle) for report updates .

The following is a summary of the FY 98 highlights.

A. The total volume of material reported recycled or diverted from the landfills is 3,558,859 cubic yards. This represents an increase of 37 percent over FY 97. These are preliminary and conservative figures and continuous updates will be supplied on ADEQ's website.

B. The diversion rate for Arizona, based on volume, is 25.8 percent. This also is a preliminary figure and will be updated on the website.

C. The recycling rate for Arizona, based on volume, is 19.5 percent. This also is a preliminary figure and will be updated on the website.

D. Since 1990, the Recycling Program awarded grants totaling over $5 million to more than over organizations.

E. The Arizona Recycling Program focuses on public education for the ultimate goal of influencing human behavior to properly reduce and dispose of solid waste, and to encourage the participation of source reduction, reuse, and

recycling. Although the basic structure of recycling education is often centered around the hierarchy of reducing, reusing and recycling (3 Rs) solid waste, the program also identifies waste reduction techniques to clarify the 3 Rs.

F. Program staff provided advice and technical assistance to jurisdictions, businesses, and the public through the distribution of literature, " how-to" guides, and case studies of specific recycling and source reduction programs. Consultation was provided through formal and informal presentations.

G. The recycling rate for used oil was 18.4 percent. This is a significant increase over last year's rate of 8.5 percent. The increase is a result of more form oil produced in Arizona and large increases in the amount of oil exported to Alabama, California, and Indiana to be re-refined or used as lubrication stock.

II. Waste Stream Components Analysis

The Arizona Solid Waste Recycling Act (A.R.S. §49-832.C.3.) requires the annual report to include an analysis of the various components of the waste stream and to propose changes that will conserve energy and reduce solid waste generation. Studies have been completed that analyze specific Arizona municipal and regional waste streams[1]. Though each study provides a clear indication of the waste stream components within its specific governmental jurisdiction, the studies also indicate that each jurisdiction has a unique waste stream. The differences between waste streams and the span of years in which the studies took place make it difficult to extrapolate these studies to a statewide level. In addition, the studies do not provide information needed to evaluate the waste streams collected by private sector haulers. The Arizona Department of Environmental Quality (ADEQ) does have data available concerning the total amount of solid waste disposed in landfills[2]. The information is collected through reports forwarded with tipping fee surcharge payments. These data, along with information provided by local government jurisdictions within Arizona and national studies of waste composition, is used as the basis for the development of general waste management strategies.

A. Characteristics of the National Waste Stream

Results of studies analyzing the characteristics of the municipal solid waste stream for the United States are provided by the U.S. Environmental Protection Agency[3] (EPA). This information is valid for the 1996 calendar year. A breakdown of the national municipal solid waste stream is illustrated in Figure 2.1. A total of 209.7 million tons of municipal solid waste was generated in 1996. This is a decrease of 1.8 million tons from 1995, making 1996 the second consecutive year that a decrease occurred. The amount of waste generated per person per day decreased from 4.4 pounds in 1994 to 4.3 pounds in 1996.

B. Defining the Total Solid Waste Stream

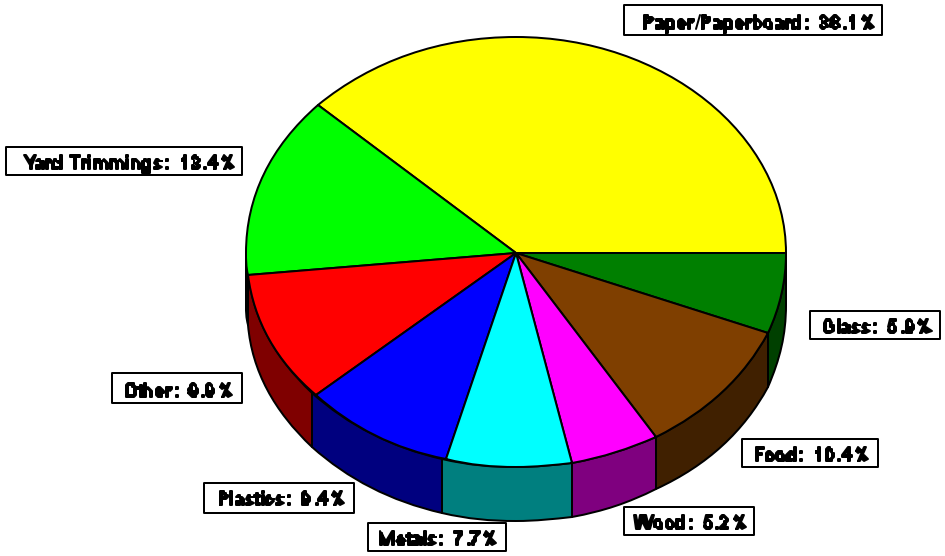
For the purpose of defining recycling rates and diversion rates for Arizona and local jurisdictions, the total solid waste stream is composed of the municipal and non-municipal solid waste streams. The EPA defines municipal solid waste (MSW) as

[1] For a list of the waste stream studies available from ADEQ see Appendix C.

[2] For a list of active landfills and the tonnage of waste accepted at each see Appendix B.

[3] *Characterization of Municipal Solid Waste in the United States: 1997 Update;* EPA530-R-98-007, U.S. Environmental Protection Agency, June 1998.

Figure 2.1 The components of the municipal solid waste stream for the United States for the 1996 calendar year. The total weight of the national municipal solid waste stream during that year was 209,700,000 tons.



wastes such as durable, non-durable goods, containers and packaging, food scraps, yard trimmings, and miscellaneous inorganic wastes from residential, commercial, institutional, and industrial solid waste sources[4]. Examples of wastes from these categories include appliances, automobile tires, newspaper, clothing, boxes, disposable tableware, office and classroom paper, wood pallets, and cafeteria waste. Public concern relating to solid waste management tends to focus on this portion of the solid waste stream as it is the only portion that can be influenced directly from the home, business or office. Recycling rates are based solely on materials recycled from MSW. The full waste stream produced by the United States includes heavy industrial and commercial wastes. These are considered non-municipal solid waste and constitute a significant portion of the waste stream. Examples of non-municipal solid waste include construction and demolition debris, automobile bodies, municipal sludge, combustion ash, and industrial process wastes that might be disposed of in municipal solid waste landfills. This report will attempt to separate information concerning MSW from the remainder of the waste stream whenever possible. This will allow the determination of a recycling rate based

[4] Ibid.

solely on the amount of MSW recycled. It will also allow the determination of a diversion rate based on the entire waste stream and the total amount of all waste recycled.

C. Solid Waste Reduction and Energy Conservation

The efforts that the department recommends to enhance source reduction and energy conservation are the same as last year: buying recycled content products and encouraging backyard composting.

Buying recycled-content products creates a demand for materials collected in recycling programs. This not only reduces the amount of waste landfilled, but also significantly reduces the energy needed to produce the new products. Paper is a good example. According to Figure 2.1, paper products comprise approximately 38.1 percent of the waste stream. Recycled-content paper is readily available and performs as well as virgin paper products in computer printers, copy machines and printing presses. Buying paper made with recycled content stimulates markets producing these products. This stimulation is transmitted back through the recycling loop to increasing production of recycled content paper which increases the collection of waste papers for recycling. This is a closed loop in Arizona for newsprint and corrugated cardboard containers which are used as a feedstock at the Stone Container mill in Snowflake to produce newsprint and liner board. Likewise, industrial paper waste is used by Wisconsin Tissue in Flagstaff to produce recycled-content tissue products.

In addition, the energy savings inherent in this process are significant. The amount of energy saved by recycling waste paper is equivalent to 4,100 kilowatts per ton[5]. This type of savings occurs for almost every material. Producing aluminum from used beverage containers (UBCs) saves 95 percent of the energy that using bauxite ore would consume. Producing a glass container from recycled glass (cullet) saves enough energy to light a 100 watt light for four hours.

To encourage the buying-recycled habit, ADEQ and the Arizona Department of Commerce sponsored the second annual Buy Recycled Expo held on November 18 and 19, 1997. The expo was produced by Arizona Clean and Beautiful and held in conduction with the Governors' Pride in Arizona Awards[6]. ADEQ will join again with Arizona Department of Commerce to sponsor the third annual Buy Recycled Expo to be held November 19, 1998.[7]

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[5]Environmental Evaluator; Wisconsin Tissue; Menosha, WI, 1991.

[6]For a description of this project see section VI.

[7]For a description of this project see section VII.

Backyard composting is a direct way individual residents can practice source reduction. Second only to paper, yard trimmings represent 13.4 percent of the municipal solid waste stream. Therefore, backyard composting programs have the potential to significantly reduce the waste stream. In addition, by reducing waste at its source, the energy used to transport, process and/or dispose of the material is saved. Because of their decentralized nature, backyard composting programs are extremely hard to track. Therefore, any waste reduction and energy savings produce by the programs have not been quantified.

There are many backyard composting programs sponsored by individual jurisdictions within the state. During the FY 1998, ADEQ sponsored a backyard composting program operated by the city of Yuma with funding from a 1997 Waste Reduction Assistance grant program[8].

D. Legislative Mandates for Waste Reduction

The intent of the Arizona State Legislature in passing the Recycling Act in 1990 was to give Arizona residents the opportunity to recycle. Many local government jurisdictions provide a variety of recycling opportunities. During the Fall of 1997, discussions were held with recycling and waste disposal stakeholders pertaining to setting a non-mandated state recycling goal. However, feedback from these discussions indicated that a recycling goal was not a priority.

Since Arizona has low landfill disposal fees as compared to other states and still has potential land for future landfills, recycling costs in many areas are greater than the cost to dispose of materials. State demographics indicate that many jurisdictions with sparse populations, or those located great distances from recycling markets, have difficulty initiating and maintaining successful recycling programs[9]. To assist small communities, the State Recycling Program encourages communities to recycle. Educational materials, technical assistance, grants, and seminars are provided to help find alternatives that will reduce the solid waste streams entering landfills for disposal. In addition, a special Waste Reduction Assistance grant offered in 1997 was restricted to jurisdictions with populations under 100,000[10]. The purpose of this grant was to address the special challenges that small and rural communities face when establishing recycling programs.

Feedback from stakeholders suggest that mandating recycling in Arizona at this time

[8]For an assessment of this project see Section V.B. of this volume.

[9]*State of Arizona Recycling Annual Report*; Arizona Department of Environmental Quality, 1995, pages 40-44.

[10]For an assessment of the projects awarded by this grant see Section VI.

could be counterproductive. It would require cities and towns with scant financial resources to initiate recycling programs having capital costs and transportation costs that, alone, make recycling economically burdensome. The voluntary approach has resulted in small communities making incremental strides, within their means, to create or expand sustainable recycling programs. The Recycling Program has been instrumental in assisting such small community programs.

E. Types of Solid Waste Disposed

The Arizona Solid Waste Recycling Act of 1990 imposed a 25 cent disposal fee for each ton (6 uncompacted cubic yards, or 3 compacted cubic yards) of waste received at the landfills regulated by ADEQ[11]. Information supplied by reports accompanying payments from the landfill operators has made it possible to determine the total amount of waste landfilled in Arizona.

Other disposal methods, which represent a small amount of MSW, include combustion and illegal (wildcat) dumping. Through questionnaires returned to ADEQ by public jurisdictions and surveys returned to the Recycling Market Development Study by private sector recyclers, the approximate amount of MSW recycled was identified. These figures are discussed in section III.

There are not any MSW combustion facilities in Arizona. Although there are some medical waste incinerators, medical waste represents a very small percentage of the solid waste stream. Used oil is burned in certain manufacturing processes, such as the production of asphalt. ADEQ keeps records concerning this activity, and the amount of used oil burned can be quantified. Wildcat dumping is a serious problem in some rural areas of the state. However, the amount of material disposed of in this manner is, likely, non-significant when compared to the amount of waste disposed of in the proper fashion.

The amount of material landfilled, combined with the amount of material reported recycled, or diverted, supplies a fairly complete picture of the waste generated in Arizona. Once the amount of total waste is determined, it can be used to determine the per capita generation rate of MSW for Arizona. Figure 2.2 contains the equations to determine the generation rate.

A total of 5,762,406 tons of waste was reported landfilled in Arizona during FY 1998. This total is 833,149 tons, or 16.9 percent more than calendar year 1996[12]. This includes not

[11] Arizona revised statutes §49-836. Solid waste landfill disposal fees.

[12] The total of 4,886,453 tons landfilled from last year's report has been updated to 4,929,257 tons.

only MSW, but also all solid waste. It also includes material imported from other states to be landfilled in Arizona. To determine the amount of this waste that was MSW, landfills were requested to identify the percentage of intake that was not Arizona in-state MSW. Using this information the total amount of in-state MSW landfilled in Arizona was 4,376,746 tons. At this time, ADEQ can neither determine what percentage of this remaining material is not municipal solid waste, nor what percentage has been imported from out of state.

Figure 2.2: The mathematical equations and data required to determine the MSW generation rate for Arizona. Total waste landfilled can be found in Appendix B. Non-MSW landfilled includes material received by construction and demolition landfills and material identified by other landfills as non in-state municipal solid waste. Figures for diverted materials are explained in Section III.

GENERATION RATE

Generation Rate = $\dfrac{\textbf{(Total MSW Generated)*(2000 pounds/ton)}}{\textbf{(Population)*(365 days/year)}}$

Total MSW Generated = Total MSW Landfilled + Total MSW Diverted

Total MSW Landfilled = Total Waste Landfilled - Non In-state MSW Landfilled

Total MSW Diverted = Total Waste Diverted - Non-MSW Diverted

Total Waste Diverted =	1,537,938 tons
Total Non-MSW Diverted =	772,475 tons
Non In-State-MSW Landfilled =	1,119,386 tons
Total Waste Landfilled =	5,762,406 tons
Population of Arizona =	4,612,054 persons

To determine the total amount of MSW generated in the state, the amount of MSW diverted from the landfills must also be determined. The amount of waste that was reported as diverted during the FY 1997 was 1,537,938 tons. A portion of this, 772,475 tons, was non-MSW. Eliminating this from the total diverted leaves 765,463 tons of MSW diverted from landfills.

Combining the amount of in-state MSW with the amount of MSW diverted gives the total amount of MSW generated in Arizona, 5,142,209 tons. This is an increase of 41,629 tons,

0.82 percent more than in FY 1997[13]. Based on a population of 4,709,400[14] for Arizona, the per capita MSW generated in Arizona is 6.08 pounds per person per day. This represents a 1.0 reduction from last year[15], and can be attributed to the specific information from landfills identifying the proportion of in-state MSW they accept. The state's waste generation rate is still 41 percent greater than the national average. As more responses are received from landfills operated in the state, the amount of non-MSW and out-of-state waste being landfilled in Arizona will be clearer and is expected to result in a generation rate closer to the national average.

F. National Market Trends

Recyclable commodity markets are relatively young, which leads to exaggerations in the price fluctuations that all commodity markets experience. Normal price changes occur, year in and year out, due to seasonal activities such as holidays and regularly scheduled manufacturing mill shut downs (down times). However, additional factors influence price. During the FY 1998, the most prevalent of these additional factors included the relative availability of virgin and recyclable feedstocks, economic conditions at home and abroad, and the development of new products and packaging with recycled content.

There are more than 40 recyclable commodity markets. The Arizona Recycling Program focuses on four major types. Analyses and graphs of these four commodities provided in this section. Each commodity type is broken into various subcategories which experience their own fluctuations. The prices given represent national averages paid by the manufacturing industry as presented in *The Recycling Manager.* They are consistently higher than prices paid by processors to communities and individuals.

Paper

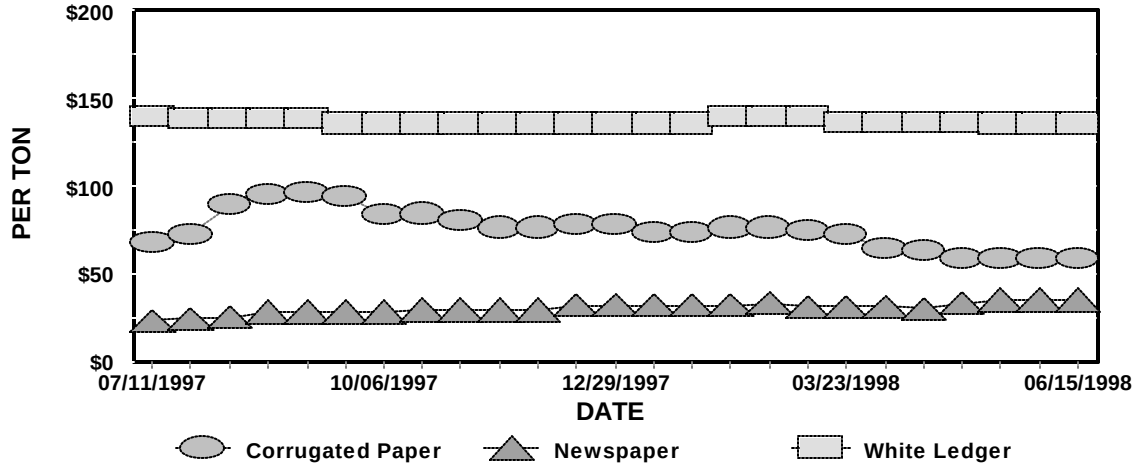
The commodity market for recyclable paper experienced a positive year in FY 1998. In June 1998, the prices were higher than the previous year and remained relatively

[13]The total amount of MSW generated of 5,723,512 from last year's report has been updated to 5,244,314 tons.

[14]Arizona Department of Economic Security, Research Administration, Population Statistics Unit.

[15]The per capital waste generated of 6.82 pounds per person per day from last year's report has been updated to 6.11 pounds per person per day.

Figure 2.3 Recyclable paper for Fiscal Year 1998. Paper grades include, old corrugated containers, old newspaper, and white ledger. Prices are taken from the Recycling Manager, Volume 7, numbers 14 - 26, and volume 8, numbers 1 - 13. Figures are national averages reported bi-weekly in dollars per ton.



steady. Figure 2.3 illustrates the price fluctuations for old corrugated containers (cardboard), old newspaper, and white office paper.

The only paper commodity to experience extreme price fluctuations during FY 1998 was old corrugated containers (OCC). Prices climbed to a high of $96.00 per ton on September 6, 1997[16]. The market maintained these high prices throughout the fall of 1997, causing the normal seasonal price drop during the winter of 1998 to be relatively sharp. Prices then settled between $78.00 to $72.00 per ton for much of the second half of FY 1998. Demands for OCC usually decrease during this time of year because of manufacturing mill down times and employee vacations, so the lower prices were somewhat expected[17]. The large price fluctuations for OCC carried over to other paper markets, such as old newspaper and mixed residential, and helped to increase the prices paid for those commodities[18]. Old newspaper can be divided into two major grades, Newsprint #8 and Newsprint #6. Newsprint #8 is a higher quality grade used by paper manufacturers in Arizona and is the grade tracked by the Recycling Program. This commodity experienced a steady increase in price over FY 1998. It began the year at $23 per ton and ended at $35 per ton[19]. This positive trend was in contrast to the previous

[16] Recycling Manager; Chilton Publishers, New York, NY, Vol. 7, no. 18, p. 1, 1997.

[17] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 50, p. 22, 1998.

[18] Waste News; Crain Publications, Detroit, MI, vol. 3, no. 16, p. 22, 1998.

[19] Recycling Manager; Chilton Publishers, New York, NY, Vol. 7, no. 13, p. 1, 1997.
Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 13, p. 1, 1998.

year when it decreased from $35 per ton to $23 per ton[20]. During the beginning of FY 1998, domestic mills were not taking normally scheduled down times and, therefore, Canadian and Asian mills competed for the tighter supply of old newspaper[21]. This drove the price higher. Toward the end of fiscal year, the economic crisis in Asia forced many mills across the Pacific to shut down.

During FY 1998, high grade papers, such as white office paper, were consumed at healthy rates by manufacturing mills domestically and in Mexico and Asia. Tissue mill expansions increased demands for white ledger and computer printout paper grades and temporarily increased the prices for those commodities[22]. Overall, the price for white ledger held at approximately $135 per ton[23].

Plastics

Prices for recyclable plastic commodities fluctuated significantly over the last fiscal year (Figure 2.4) and overall, showed a reverse in the trends that occurred the year prior[24]. High Density Polyethylene (HDPE)[25] prices soared during FY 1997, imitating the price increases paid for virgin resin. These same resin prices played a significant role in the price reversal for HDPE this year[26]. In contrast, Polyethylene Terephthalate (PET)[27] prices, which bottomed out last year when oil companies flooded the market with virgin resins, climbed steadily throughout the 1998 FY. The ultimate result was that by the end of Fiscal Year 1998, PET and HDPE prices edged closer together than usual.

HDPE was considered a hot commodity at the beginning of the year, but as time progressed, prices dropped significantly. Chemical companies flooded the market and

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[20] Recycling Manager; Chilton Publishers, New York, NY, Vol. 6, no. 12, p. 1, 1996.
Recycling Manager; Chilton Publishers, New York, NY, Vol. 7, no. 13, p. 1, 1997.

[21] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 50, p. 22, 1998.

[22] Waste News; Crain Publications, Detroit MI, Vol. 3, no. 24, p. 42, 1997.

[23] Recycling Manager; Chilton Publishers, New York, NY. Vol. 8, no. 10-13, p. 1, 1998.

[24] State of Arizona Recycling Program Annual Report, EQR 97-20, p. 12, 1997.

[25] HDPE: #2 plastic, i.e., milk jugs and detergent bottles.

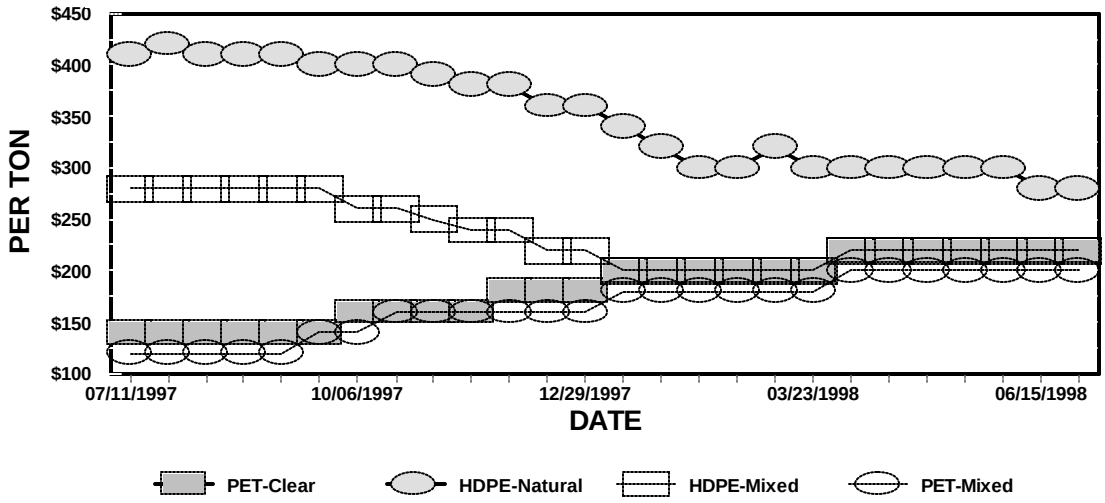
[26] State of Arizona Recycling Program Annual Report, EQR 97-20, p. 12, 1997.

[27] PET: #1 plastic, ie., soft drink bottles.

sold virgin resins at low prices[28]. This sent prices for scrap HDPE sliding downward, reaching as low as $200 per ton during the first three months of FY 1998[29]. In addition to an over abundance of virgin resin, the downturn in prices was also attributed to the problematic Asian economy, which reduced overseas demand. Many mills in Asia, especially those in South Korea, were closing. Those that continued to import plastics were hard-pressed to pay for scrap material with devalued currencies[30].

Prices for scrap PET improved steadily throughout FY 1998. Clear PET increased from $140 per ton to $220 per ton and mixed PET increased from $120 per ton to $200

Figure 2.4 Recyclable plastic prices for Fiscal Year 1998. Plastic grades include clear PET, mixed PET, natural HDPE and colored HDPE. Prices are taken from the Recyling Manager, Volume 7, numbers 14 - 26, and Volume 8, numbers 1 - 13. Figures are national averages reported bi-weekly in dollars per ton.



person[31]. The price climb was triggered by oil companies and the limits they placed on the amount of virgin PET resin material they made available[32]. This created competition for the amount of PET scrap plastic available, and therefore, prices increased. At the end of Fiscal Year 1998, competition for PET was still stiff, and the outlook is for prices to

[28] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 14, p. 22, 1997.

[29] Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 1, p. 1, 1998. Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 5, p. 1, 1998.

[30] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 44, p. 26, 1998.

[31] Recycling Manager; Chilton Publishers, New York, NY, Vol. 7, no. 13, p. 1, 1997. Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 13, p. 1, 1998.

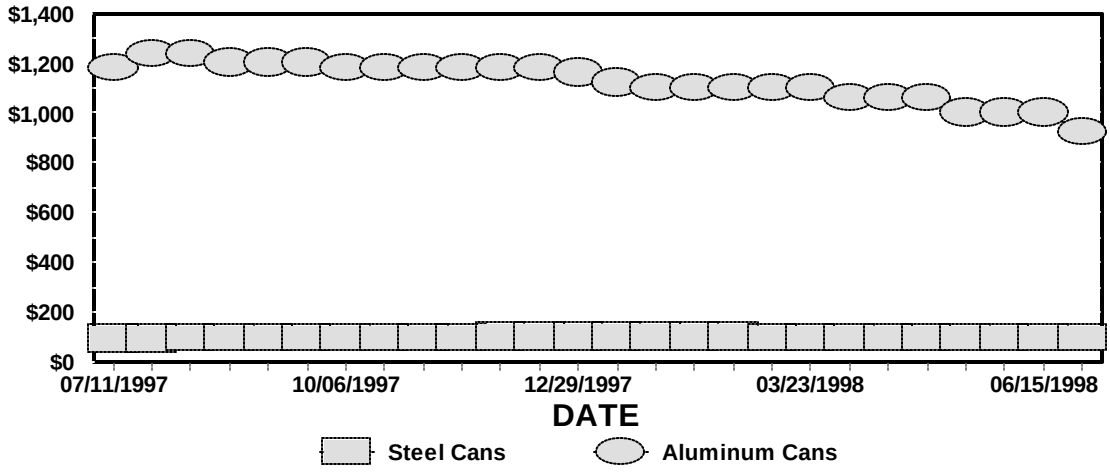
[32] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 14, p. 22, 1997.

remain healthy[33].

Metals

Recycled metal markets are considered fairly stable due to their maturity, and therefore, do not experience the fluctuations inherent in the paper and plastic markets. The Arizona Recycling Program tracks two types of post consumer metal: used aluminum beverage cans (aluminum) and used steel cans (steel). Figure 2.5 shows the prices for these commodities during FY 1998.

Figure 2.5 Recyclable metal prices for Fiscal Year 1998. Metals tracked include steel cans ("tin can", bi-metal cans") and aluminum cans. Prices are taken from the Recycling Manager, Volume 7, numbers 14 - 26, and Volume 8, numbers 1 - 13. Figures are national averages reported bi-weekly in dollars/ton.



Scrap aluminum prices change according to the demands for new aluminum products and the availability and price of virgin material on the market. During the first half of FY 1998, prices appeared to stabilize at, or just under, $1,200 per ton. However, the prices for both scrap aluminum and high-grade virgin aluminum started a downward track[34]. By June 29, 1998, prices were a dismal $920 dollars per ton[35]. Limited domestic demands, perhaps affected by the introduction of the single serving PET soft drink bottle, and nearly non-

[33] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 41, p. 22, 1998.

[34] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 37, p. 22, 1998.

[35] Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 13, p. 1, 1998.

existent demands from Asia kept inventories high and prices low[36]. A mild winter also led to higher inventories of scrap aluminum. More cold beverages were sold than would have been during a cold winter, so more recycled aluminum became available. This additional influx of scrap aluminum helped hold prices down.

Recycled steel showed significant price increases during FY 1998 as it rode the wave of consumer purchases spawned by a strong American economy. Increased production and plans to open new steel mills increased competition for available steel scrap[37]. This drove prices up. Prices that started as low as $92 per ton last year[38] were as high as $101 per ton in January of 1998[39]. By the end of the fiscal year, the weakening Asian economies reduced export, especially on the West Coast[40]. By March prices had dropped back to $99.00 per ton[41], a price still higher than those listed the year before.

Glass

Recycled glass has been the most stable of all of the major recyclable commodities. Even though it lost some market share to other commodities such as aluminum and plastic, and overall demand for new glass production is down, prices fell only slightly over the past year. A decrease in price of two dollars per ton affected clear (flint) and green glass, while brown (amber) glass remained steady all year. There has been a slight increase in interest for recycled glass, perhaps caused by the increased popularity of micro breweries[42].

[36] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 44, p. 26, 1998.

[37] Waste Age; Waste Age Publications, Washington, DC, vol. 29, no. 3, p. 80, 1998.

[38] Recycling Manager; Chilton Publishers, New York, NY, vol. 7, no. 13, p. 1, 1997.

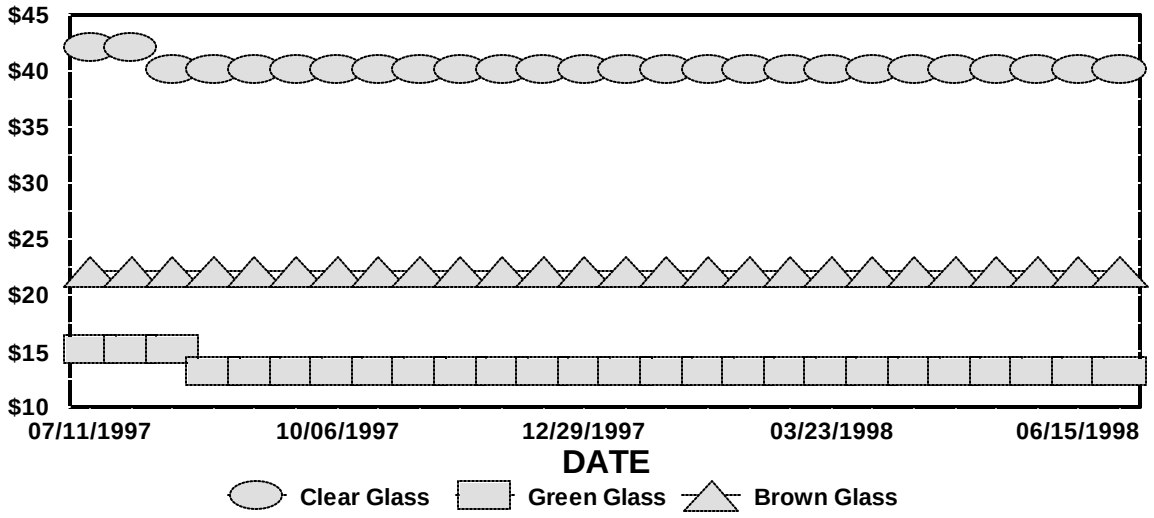
[39] Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 13, p. 1, 1998.

[40] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 44, p. 26, 1998.

[41] Recycling Manager; Chilton Publishers, New York, NY, Vol. 8, no. 5, p. 1, 1997.

[42] Waste News; Crain Publications, Detroit, MI, Vol. 3, no. 34, p. 12, 1998.

Figure 2.6 Recyclable glass prices for Fiscal Year 1998. Glass colors include clear (flint), brown (amber), and green. Prices are taken from the Recycling Manager, Volume 7, numbers 14 - 26, and Volume 8, numbers 1 - 13. Figures are national averages reported bi-weekly in dollars per ton.



III. RECYCLING VOLUMES AND PROGRAMS

The Arizona Solid Waste Recycling Statute (A.R.S. §49-832.C.2.) requires that the volume of material recycled during the preceding year be reported annually. This section reports these figures for FY 1998. Information reported in this section includes:

A. The jurisdictions which responded to the distributed questionnaires.

B. The total amount of material reported as recycled and/or diverted from landfills by jurisdictions, and the composition of that material.

C. The materials recycled, and/or diverted by each individual jurisdiction.

D. The diversion rate for Arizona.

E. The recycling rate for Arizona.

F. The historical growth of the volumes of materials reported recycled and/or diverted from 1991 through 1998.

G. The status of curbside recycling programs within the state.

H. A synopsis of other public and private recycling programs within the state.

The information presented concerning public sector recycling was gathered through the annual waste reduction and recycling questionnaire. The Arizona Recycling Program's questionnaire is distributed to all local government jurisdictions within the state. A private sector survey, conducted in cooperation with the Arizona Department of Commerce, was distributed to all known private recycling companies, private composters, unincorporated communities, non-profit organizations, manufacturers of recycled content products and active landfills.

The response rate for public jurisdictions increased for FY 1998 and the Arizona Recycling Program appreciates the cooperation of the respondents. The response rate for the private survey increased dramatically this past year. However, at the time of publication of this report, data from the private sector survey had not been fully compiled as responses are still being received. Therefore, the information presented here is not the entire picture of recycling in Arizona. As information from the private sector is compiled, the recycling rate, diversion rate and generation rate for Arizona will be revised on the ADEQ's website, www.adeq.state.az.us/waste/solid/recycle.

A. Response Statistics

The Arizona Recycling Program distributed its Annual Solid Waste Reduction and Recycling Questionnaire for the FY 1998 to 102 governmental jurisdictions in Arizona. Eighty-three of the local governments completed and returned the questionnaire. In addition, one jurisdiction supplied information over the phone. This represents a 82.4 percent response rate. The number of citizens represented by the responding jurisdictions accounts for 98.1 percent of the state's population. Partial information is presented for many smaller jurisdictions lacking the staff needed to track the flow of recyclable material. Measures also were taken to avoid double counting of recyclable material.

B. Volumes and Composition of Material Diverted in Fiscal Year 1998

Volume information was reported by 64 of the jurisdictions for FY 1998. This is an increase of nine jurisdictions over last year, and represents the highest number of qualitative questionnaire responses received. The increase is the result of the excellent response to the Treecycle survey conducted in January 1998. In an effort to describe a more complete picture of the status of recycling and waste diversion in Arizona, the Arizona Recycling Program included recycling volume information from additional sources. These sources include the waste tire diversion program, used oil diversion program, and bio-solids (waste water treatment sludge) diversion reports.

A summary of the volumes of material diverted from the state's landfills during the FY 1998 is given in Table 3.1. These totals are compared to the figures for the FY 1997. Volumes are reported in cubic yards as required by statute. Their equivalents in tons are provided in Table 3.2. Diverted materials have been divided into six major categories: paper, metals, miscellaneous (textiles, rubber, oil, fly ash, household hazardous waste, etc.), organics (green, wood, yard waste, bio-solids, etc.), plastics, and glass. Table 3.2 lists the composition of the materials diverted as a percentage of the total for each material category. These proportions are also presented graphically in Figure 3.1.

The miscellaneous category represents the largest fraction of materials diverted from the landfills in the state. The bulk of the materials in this category are waste tires, fly ash, and used oil. The well-established tracking systems for waste tires and used oil produces very precise volume data for this category from year to year. As Arizona continues to recycle the very large number of waste tires it produces, the miscellaneous category will continue to account for a large portion of the waste diversion stream. The amount of fly ash consumed by the construction industry was reported and included for the first time. The diversion of this material from landfills is a major reason why the volume in this category increased so sharply. In addition, the amount of household hazardous waste (HHW) diverted from the waste stream increased. This also impacts

Table 3.1: A comparison of the amounts of material diverted by type between 1997 and 1998. 1997 and 1998 represent fiscal years (July 1 - June 30). The table shows quantities in cubic yards along with the percent increase or decrease between the two years. The information given in the table is up to date as of **October 31, 1998**.

Material	Amount Diverted (Cubic yards)		Yearly Increase
	1997[43]	1998	(Percent)
Paper	896,895	880,446	- 1.8 %
Metals	491,859	700,163	+ 42.4 %
Miscellaneous	645,245	1,050,721	+ 62.8 %
Organics	475,361	845,443	+77.9 %
Plastics	83,833	72,641	- 13.4 %
Glass	12,765	9,447	- 20.0 %
TOTAL	**2,605,959**	**3,558,859**	**+36.6** %

Table 3.2: The composition of materials diverted in Fiscal Year 1998. The quantities are given in cubic yards and tons. The percentage of the total that each material category represents is given for both units of measure to illustrate their differences[44]. The information given in the table is up to date as of **October 31, 1998**.

Material	Cubic Yards		Tons	
	Amount	Percentage	Amount	Percentage
Paper	880,446	24.7 %	346,574	22.5 %
Metals	700,163	19.7 %	190,434	12.4 %
Miscellaneous	1,050,721	29.5 %	341,583	22.2 %
Organics	845,443	23.8 %	633,228	41.2 %
Plastics	72,641	2.0 %	12,894	0.8 %
Glass	9,447	0.3 %	13,226	0.9 %
Total	**3,558,859**	**100.0 %**	**1,537,938**	**100.0 %**

[43]Figures for FY 1997 were revised since publication of the 1997 annual report.

[44]Differences between cubic yards and tons are due to the amount of open space left in the landfill by the materials, i.e. aluminum cans are mostly air even after being compressed in a landfill by burial.

the miscellaneous category. Jurisdictions are holding more HHW collection events. Likewise, the amount of HHW collected may have increased as Arizona residents became influenced to dispose of their HHW appropriately through awareness campaigns conducted by organizations such as the U.S. Environmental Recycling Hotline.

The reported diversion of organics increased during the past year and is second only to the amount of miscellaneous material. A great portion of this increase was the result of several large private composting companies responding to the private sector survey. In addition, the WRA grant program funded several composting operations. These grant projects were either new composting operations or major expansions. The private composters which received state funding account for over 100,000 tons of the organic material identified as diverted, which is a great portion of the increase reported. Organics have also been approved as alternative daily cover in landfills. Though this makes economical sense for the landfill operators, it takes valuable feedstock away from the composting industry. The process of composting the material adds more value to the commodity and supplies more jobs than using it as daily cover. In addition, its use as daily cover cannot be credited toward Arizona's diversion or recycling rate.

The amount of paper recycled and/or diverted in Arizona declined slightly during FY 1998. The decline can be attributed to a lower number of responses from organizations in the paper recycling industry. Once the responses from the recyclers that have provided information in the past are received, an overall figure that is much more representative of the industry in the state will be determined. The Arizona Recycling Program tapped new sources of data for recycled paper, such as over runs from newspaper printers and back haulers of corrugated cardboard. Therefore, the final figure for recycled and/or diverted paper for FY 1998 should surpass the figure for FY 1997.

Metals showed a marked increase in the amount of material diverted this year as compared to the previous year. A better response rate by the private metal recyclers is the reason for this increase and the resulting figures are much closer to those complied for the 1995 calendar year. This variability illustrates the importance of receiving consistent information from the private sector each year.

The volume of plastics reported as recycled and/or diverted has decreased over the past year. The Beverage Industry Recycling Program (BIRP) provided quality information regarding the recycling of plastic beverage bottles along with aluminum cans and glass bottles. However, BIRP no longer performs this function and, therefore, the data has suffered.

Finally, the amount of glass collected for recycling also decreased over the past year. Once again, this is probably the result of missing data that would have been provided by BIRP. On a positive note, major glass end-users began operations within

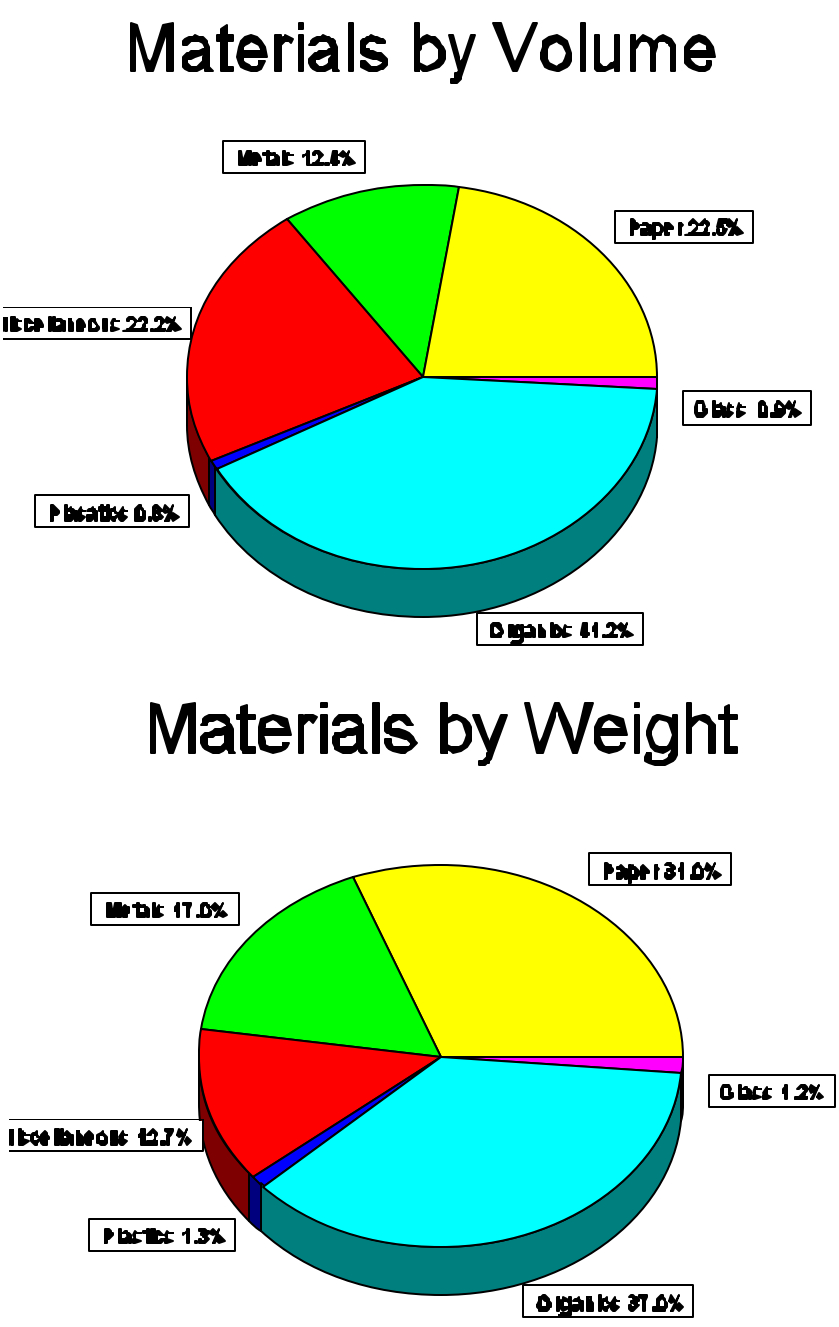


Figure 3.1: A comparison of the volume and weight of materials diverted from Arizona landfills during Fiscal Year 1998. The upper pie chart shows the breakdown of materials by percentage of volume. The total volume equals 3,558,859 cubic yards. The lower pie chart shows the breakdown of materials by percentage of weight. The total weight equals 1,537,938 tons.

Arizona during the FY 1998. The impact of these new markets should stimulate the collection and recycling of glass in FY 1999.

C. Materials Recycled by Jurisdiction

The materials diverted by each jurisdiction during the FY 1998 are listed by volume in Table 3.3. This table also divides the major material categories into separate commodities that are of interest to the recycling industry. For example, paper is divided into newspaper (ONP), cardboard (OCC), ONP/OCC, office paper, chipboard, and other paper products. Many of the separate commodities represent those traded by the recycling community. Others, such as office paper, are an aggregate of commodities too numerous to list. Combinations, such as ONP/OCC, represent materials collected together that could not be separated for reporting purposes. Complete descriptions of each commodity are given beneath the table. The equivalent data by weight are given in Table 3.4.

Maricopa County continues to lead waste diversion by recycling or diverting more material than any other jurisdiction during the FY 1998. This is the result of the waste tire diversion program. For the second consecutive year, the county delivered used tires from its waste tire collection sites to local processing facilities. The tires are recycled into crumb rubber for use in rubberized asphalt and other products, or diverted to become tire-derived fuel. The city of Phoenix remains the second largest waste diverting and recycling jurisdiction in the state. This is a result of curbside recycling program which serves two-thirds of the city's single-family residences. The city should have a substantial increase in the amount of material next year, as it is completing the implementation of the curbside program to its remaining residents. Similarly, the city of Mesa recycles and/or diverts the third largest amount of material in the state. FY 1998marked the second complete year of that city's jurisdiction-wide curbside recycling program. The city also continues its curbside green waste diversion program, which received partial funding through a 1997 WRA grant (see Section IV.B.2.).

The three jurisdictions noted above dominate the total amount of waste diverted from landfills, in part, due to their large populations. However, a more accurate measure of the success of a jurisdiction's efforts to divert material may be the jurisdiction's diversion rate. This is obtained by dividing the amount of material reported diverted by the jurisdiction by the amount of material generated. Table 3.5 lists each jurisdiction's total amount of material diverted during FY 1998 and an estimate of the municipal solid waste generated during that time period. The amount of municipal solid waste generated is determined by multiplying the jurisdiction's population by 1.453 cubic yards per person per year. This is calculated using the national average of 4.3 pounds per person per day as reported by EPA[45].

The method of obtaining diversion rates is speculative at best. The figure used as the

[45] *Characterization of Municipal Solid Waste in the United States: 1997 Update*, United States Environmental Protection Agency, EPA/530-R-98-007, July 1998.

average amount of waste generated per person per year is significantly lower this year than last, 1.453 cubic yards per person per day versus 2.223 cubic yards per person per day. This difference is due changes in the composition of municipal solid waste from year to year and uncertancies inherent in the individual conversion factors between tonnage and volume for each type of material. Therefore, there are significantly higher diversion rates for each jurisdiction this year as compared to last year.

Population figures may also be misleading. For instance, the population of Sierra Vista includes the U.S. Army base, Fort Huachuca, which has its own waste and recycling programs. This inflates the figures for solid waste generated by the city, while the city does not receive credit for material recycled by the military base. Other jurisdictions operate recycling facilities and receive material from outside the jurisdiction, thus inflating diversion figures. Counties have an advantage, as they may be responsible for diverting material for all residents, while the population figure used to calculate the county's diversion rate accounts only for citizens residing in unincorporated areas. Finally, in an effort to retain confidentiality, the Recycling Programs does not assign private recycling facility data to particular jurisdictions. Therefore, cities and towns serviced in whole, or in part, by private recycling haulers will have underestimated diversion rates. Due to these circumstances, accurate diversion rates can not be reported in all cases.

The town of Pinetop-Lakeside tops the list of diversion rates at 229 percent. Pinetop-Lakeside operates an in-vessel composting system that accepts a large percentage of the surrounding area's organic matter. In addition, the town's recycling coordinator did a thorough job of contacting local private recycling operations and included their data in the town's response to the waste reduction and recycling questionnaire. Maricopa County has the second highest diversion rate, 172 percent. The county moved up from the third position during the past fiscal year by increasing the number of tires going to processors for recycling. County governments serve as the waste tire collection organization for residents. Therefore, the counties have the advantage of receiving credit for diverting all the tires generated in their jurisdiction, while corresponding populations only reflect residents of unincorporated areas. Any tires reported recycled by cities and towns are subtracted from the county's total. However, few cities and towns take advantage of this opportunity, and those that do rarely account for tires collected through private automotive shops.

Table 3.5: Solid waste generated and diverted by local government jurisdictions. This data is based on FY 1998. Source for population statistics is Arizona Department of Economic Security, Research Administration, Population Statistics Unit. Volumes generated are determined by multiplying each jurisdiction's population by 1.453 cubic yards per person per year[46], the national average determined using data given by the EPA. The volumes that were reported as diverted may include non-municipal solid waste. This could result in the diversion rate of some jurisdictions to be over estimated.

[46] 1997 update, EPA, June 1998.

City	County	Population	Waste Generated (cu.yds)	Reported as Diverted (cu.yds)	Diversion Rate
Apache County	Apache	56,042	81430	1,005.57	1.23 %
Apache Junction	Pinal	21,872	31780	0.00	0 %
Avondale	Maricopa	26,440	38420	9,090.91	23.66 %
Benson	Cochise	4,269	6203	0.00	0 %
Bisbee	Cochise	6,554	9523	0.00	0 %
Buckeye	Maricopa	6,545	9510	0.00	0 %
Bullhead City	Mohave	28,989	42120	0.00	0 %
Camp Verde	Yavapai	8,242	11980	0.00	0 %
Carefree	Maricopa	2,660	3860	831.50	21.54 %
Casa Grande	Pinal	22,015	31990	3,537.95	11.06 %
Cave Creek	Maricopa	3,730	5420	0.00	0 %
Chandler	Maricopa	154,635	224680	38,584.89	17.17 %
Chino Valley	Yavapai	7,238	10520	0.00	0 %
Clarkdale	Yavapai	2,863	4160	132.75	3.19 %
Clifton	Greenlee	3,045	4420	7.22	0.16 %
Cochise County	Cochise	45,811	66560	5,211.14	7.83 %
Coconino County	Coconino	47,325	68760	12,987.97	18.89 %
Colorado City	Mohave	3,842	5580	0.00	0 %
Coolidge	Pinal	7,206	10470	212.53	2.03 %
Cottonwood	Yavapai	6,916	10050	2,269.92	22.59 %
Douglas	Cochise	15,234	22140	398.40	1.8 %
Duncan	Greenlee	793	1150	0.00	0 %
Eagar	Apache	4,788	6960	0.00	0 %
El Mirage	Maricopa	5,785	8406	0.00	0 %
Eloy	Pinal	9,303	13520	0.00	0 %
Flagstaff	Coconino	58,300	84710	3,698.83	4.37 %
Florence	Pinal	11,653	16930	519.20	3.07 %
Fountain Hills	Maricopa	16,980	24670	0.00	0 %

City	County	Population	Waste Generated (cu.yds)	Reported as Diverted (cu.yds)	Diversion Rate
Fredonia	Coconino	1,321	1919	0.00	0 %
Gila Bend	Maricopa	1,790	2601	0.00	0 %
Gila County	Gila	23,574	34250	12,456.04	36.37 %
Gilbert	Maricopa	83,370	121100	17,608.80	14.54 %
Glendale	Maricopa	198,660	288700	5,550.18	1.92 %
Globe	Gila	7,430	10800	9.35	0.09 %
Goodyear	Maricopa	13,090	19020	336.94	1.77 %
Graham County	Graham	17,104	24850	6,376.96	25.66 %
Greenlee County	Greenlee	4,991	7252	548.60	7.56 %
Guadalupe	Maricopa	5,440	7904	360.39	4.56 %
Hayden	Gila	910	1322	0.00	0 %
Holbrook	Navajo	5,532	8038	2,910.13	36.2 %
Huachuca City	Cochise	2,027	2945	0.00	0 %
Jerome	Yavapai	578	840	90.05	10.72 %
Kearny	Pinal	2,544	3696	4.64	0.13 %
Kingman	Mohave	18,724	27210	2.67	0.01 %
Lake Havasu City	Mohave	41,362	60100	4,759.47	7.92 %
La Paz County	La Paz	14,201	20630	156.25	0.76 %
Litchfield Park	Maricopa	4,330	6291	0.00	0 %
Mammoth	Pinal	2,001	2907	0.00	0 %
Marana	Pima	9,464	13750	0.00	0 %
Maricopa County	Maricopa	192,955	280400	482,637.82	172.12 %
Mesa	Maricopa	365,800	531500	62,950.96	11.84 %
Miami	Gila	2,054	2984	4.67	0.16 %
Mohave County	Mohave	44,711	64970	1663.53	2.56 %
Navajo County	Navajo	51,725	75160	3,140.96	4.18 %
Nogales	Santa Cruz	21,154	30740	37.38	0.12 %
Oro Valley	Pima	24,738	35940	0.00	0 %

City	County	Population	Waste Generated (cu.yds)	Reported as Diverted (cu.yds)	Diversion Rate
Page	Coconino	8,622	12530	75.28	0.6 %
Paradise Valley	Maricopa	13,040	18950	0.00	0 %
Parker	La Paz	2,992	4347	0.00	0 %
Patagonia	Santa Cruz	959	1393	0.00	0 %
Payson	Gila	12,697	18450	4.67	0.03 %
Peoria	Maricopa	85,245	123900	808.67	0.65 %
Phoenix	Maricopa	1,238,120	1799000	212,298.94	11.8 %
Pima	Graham	2,051	2980	0.00	0 %
Pima County	Pima	314,468	456900	288,142.28	63.06 %
Pinal County	Pinal	72,987	106100	9,014.13	8.5 %
Pinetop-Lakeside	Navajo	3,529	5128	11,747.22	229.08 %
Prescott	Yavapai	32,806	47670	2,806.74	5.89 %
Prescott Valley	Yavapai	20,618	29960	18.69	0.06 %
Quartzite	La Paz	2,117	3076	0.00	0 %
Queen Creek	Maricopa	3,840	5580	0.54	0.01 %
Safford	Graham	9,942	14450	0.00	0 %
Sahuarita	Pima	2,492	3621	0.00	0 %
Santa Cruz County	Santa Cruz	14,528	21110	5,926.09	28.07 %
San Luis	Yuma	10,408	15120	82.57	0.55 %
Scottsdale	Maricopa	192,010	279000	53,099.71	19.03 %
Sedona	Yavapai	9,660	14040	4,122.04	29.36 %
Show Low	Navajo	7,407	10760	0.00	0 %
Sierra Vista	Cochise	39,428	57290	11,946.55	20.85 %
Snowflake	Navajo	4,375	6357	0.00	0 %
Somerton	Yuma	6,426	9337	0.00	0 %
South Tucson	Pima	5,688	8265	0.00	0 %
Springerville	Apache	1,977	2873	0.00	0 %
St. Johns	Apache	3,398	4937	0.02	0 %

City	County	Population	Waste Generated (cu.yds)	Reported as Diverted (cu.yds)	Diversion Rate
Superior	Pinal	3,498	5083	0.00	0 %
Surprise	Maricopa	16,405	23840	0.00	0 %
Taylor	Navajo	2,829	4111	0.00	0 %
Tempe	Maricopa	160,225	232800	42,465.35	18.24 %
Thatcher	Graham	4,166	6053	778.58	12.86 %
Tolleson	Maricopa	4,435	6444	54.55	0.85 %
Tombstone	Cochise	1,478	2148	0.93	0.04 %
Tucson	Pima	461,001	669800	44,802.63	6.69 %
Wellton	Yuma	1,201	1745	0.00	0 %
Wickenburg	Maricopa	5,045	7330	400.00	5.46 %
Willcox	Cochise	2,811	4084	0.00	0 %
Williams	Coconino	2,8110	40840	90.91	0.22 %
Winkelman	Gila	418	607	0.00	0 %
Winslow	Navajo	11,097	16120	10.14	0.06 %
Yavapai County	Yavapai	42,324	61500	16,827.52	27.36 %
Youngtown	Maricopa	2,725	3959	0.00	0 %
Yuma	Yuma	65,405	95030	4,056.99	4.27 %
Yuma County	Yuma	47,997	69740	9,420.22	13.51 %
Totals		4,612,054	6701000	989,212.76	14.76 %

Pima County, with a diversion rate of 63 percent, ranks third. In addition to the large number of used tires the county diverts, it also tracks the recycling activities of the private waste haulers operating within its boundaries. These activities include many curbside recycling programs. The diversion of used tires placed Gila County at fourth with a diversion rate of 36 percent. The town of Holbrook also diverted 36 percent. The town achieved this by contacting local private recyclers, in a similar fashion to Pinetop-Lakeside. From the information presented in Table 3.5, several preliminary conclusions concerning the relationship between certain types of recycling programs and diversion rates can be made. A jurisdiction having just a Treecycle program (Christmas tree recycling), such as Kearny and Winslow, will have a diversion rate near 0.05 percent, but a particularly successful program may achieve a diversion rate as high as 0.2 percent.

Drop-off recycling programs, such as Flagstaff, should reach a diversion rate between 5 and 10 percent. However, extremely successful programs which involve surrounding communities, such as Sedona and Sierra Vista, can reach diversion rates of over 20 percent. Curbside recycling normally diverts between 10 percent and 20 percent of the municipal solid waste stream. Chandler, Gilbert, Phoenix, Mesa, Scottsdale, and Tempe are examples of such programs. Finally, adding a green waste diversion to any of these programs will divert a significantly larger amount of waste as green waste comprises about 25 percent of the municipal solid waste stream in Arizona.

D. The Diversion Rate for Arizona

Although the diversion rates for individual jurisdictions can be misleading, a total diversion rate for Arizona can be determined as the ratio between the total volume of material diverted during FY 1998 and the total volume of waste generated within the state. This equation is given in Figure 3.2. The total volume of waste diverted from Arizona landfills during FY 1998 is 3,558,859 cubic yards. This is equivalent to the amount of landfill space saved by recycling and other methods of waste diversion, as the factors that convert tons to cubic yards account for compaction under landfill settings. Landfill data obtained by the ADEQ indicates that a total of 5,762,406 tons of waste was landfilled in FY 1998. Out-of-state waste accounted for 226,274 tons, and may be subtracted from the total. This leaves 5,536,132 tons as the amount of in-state waste landfilled. This can be converted to cubic yards by dividing by 0.5403 tons per cubic yard. The result is 10,250,000 cubic yards of in-state waste landfilled. The total volume of waste generated is the sum of the in-state waste reported as landfilled and the total waste reported as diverted. This is 13,810,000 cubic yards. The quotient between the total waste diverted and the total waste generated, multiplied by 100, results in a diversion rate of 25.8 percent.

Figure 3.2: The mathematical equations and data required to determine the waste diversion rate for Arizona. The in-state waste landfilled can be found by subtracting the out-of-state waste landfilled from the total waste landfilled. To convert the entire waste stream from tons to cubic yards divide by 0.5403 tons/cubic yards. The total waste landfilled in tons is given in Appendix B. Total waste diverted can be found in Table 3.2

Diversion rate

Diversion Rate =	**(Total Waste Diverted)X100 / (Total Waste Generated)**
Total Waste Generated =	In-State Waste Landfilled + Total Waste Diverted
In-State Waste Landfilled (Cubic Yards) =	(In-State Waste Landfilled)/(0.5403 tons/cubic yard)
In-State Waste Landfilled (Tons) =	Total Waste Landfilled - Out-of-State Waste Landfilled
Total Volume of Waste Diverted =	3,558,859 cubic yards
Total Tonnage of Waste Diverted =	1,537,938 tons

Total Waste Landfilled =	5,762,406 tons
Out-of-State Waste Landfilled =	226,274 tons

Common practice is to report diversion rates on the basis of tonnage. Since most data received from the solid waste and recycling industries is in tons and must be converted to cubic yards for this report, it is straight forward to determine a diversion rate based on tonnage. The state diverted 1,537,938 tons of material during the FY 1998. During that same time period, 5,536,132 tons of in-state waste was landfilled. Using the same formula as above results in a diversion rate of 21.9 percent.

The difference between the two diversion rates is primarily due to the large number of waste tires diverted in Arizona. Tires weigh very little, yet they occupy a large area. Consequently, some weight is removed from landfills by diverting tires and a very large volume of the state's landfills are saved. It should be noted that not all landfills reported the composition of materials received. More out-of-state waste may be reported. In addition, not all of the private recycling companies have answered the Recycling Market Development Study surveys. Therefore, these figures should be considered preliminary and conservative. Continual updates to Arizona's diversion rates will be posted on ADEQ's website, www.adeq.state.az.us/waste/solid/ recycle.

E. The Recycling Rate for Arizona

To determine the recycling rate for Arizona, two corrections to the solid waste data must be made. First, only municipal solid waste can be considered when determining the amount of material diverted from the landfill and the amount of material entering the landfill. Second, materials diverted from the landfills by methods that are not considered true recycling must be removed from the diverted figures. The formula for Arizona's recycling rate is given in Figure 3.3. Explanations concerning how this is calculated, and concerns that need to be addressed follow.

As reviewed in Section II, pertaining to municipal solid waste generation, the Recycling Market Development Survey requested that landfills in the state identify what percentage of the material they accepted was out-of-state waste and what percentage was non-municipal solid waste (non-MSW). From the information supplied this year and last, it can be determined that 5,632,254 tons of in-state MSW was landfilled. Converting this from weight to volume by dividing by 0.5403, results in 10,410,000 cubic yards.

Figure 3.3: The mathematical equations and data required to determine the waste recycling rate for Arizona. The recycling rate is determined by a similar method as the recycling rate. However, corrections must be made to eliminate non-MSW and out-of-state waste from the diversion and landfill figures, and to eliminate material that was diverted by methods not considered true recycling. Total waste landfilled can be found in Appendix B, and total waste diverted can be found in Table 3.1.

Recycling Rate

Recycling Rate = **(MSW Recycled)X100**
(In-State MSW Generated)

MSW Recycled =	MSW Diverted - MSW Diverted but Not Recycled
MSW Diverted =	Total Waste Diverted - Non-MSW Diverted
In-State MSW Generated =	In-State MSW Landfilled +Total MSW Diverted
In-State MSW Landfilled (cubic yards) =	(In-State MSW Landfilled (Tons))/(0.5403 tons/cubic yard)
In-State MSW Landfilled (Tons) =	In-State Waste Landfilled - In-State Non-MSW Landfilled
In-State Waste Landfilled (Tons) =	Total Waste Landfilled - Out-of-State Waste Landfilled

MSW Diverted but Not Recycled (Cubic Yards) =	160,570 cubic yards
MSW Diverted but Not Recycled (Tons) =	46,392 tons
Non-MSW Diverted (Cubic Yards) =	1,418,686 cubic yards
Non-MSW Diverted (Tons) =	765,463 tons
Total Waste Diverted (Cubic Yards) =	3,558,859 cubic yards
Total Waste Diverted (Tons) =	1,537,938 tons
In-State Non-MSW Landfilled =	1,119,386 tons
Total Waste Landfilled =	5,762,406 tons
Out-of-State Waste Landfilled =	226,274 tons

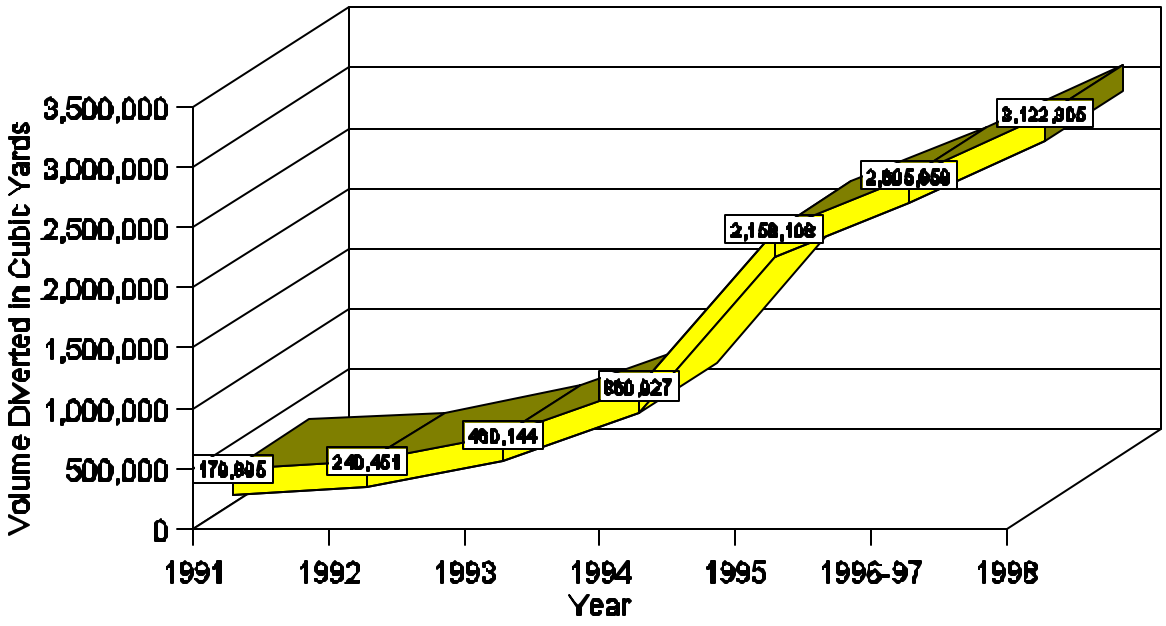
As previously discussed, the amount of waste diverted must also be corrected to determine the recycling rate. First, the portions of the diverted waste stream that are not considered MSW must be removed. This includes auto bodies, sludges, construction and demolition debris, fly ash, and pre-consumer materials. The total amount of non-MSW diverted is 1,418,686 cubic yards. Second, materials diverted by methods that are not considered true recycling must be removed. These methods include waste to energy processes, and the reuse of items. Materials burned for energy in Arizona are limited to used oil, and a portion of the waste tire stream. Wooden pallets repaired and reused in the agricultural industry represent the bulk of the items classified as reused. The total amount of MSW diverted by methods not considered true recycling is 160,570 cubic yards.

With these changes considered, a recycling rate for the FY 1998 can be calculated. The total volume of material diverted, but not recycled is 1,579,256 cubic yards. This leaves 1,979,603 cubic yards truly recycled. The amount of MSW generated equals the sum of the MSW landfilled, and MSW diverted.

This is 10,141,000 cubic yards. The recycling rate is determined by dividing the amount of MSW recycled by the amount of MSW generated. The result is a recycling rate of 19.5 percent. The same method, using weight rather than volume, yields a recycling rate of 14.3 percent.

As with the diversion rate, the difference is between the recycling rate by volume and the recycling rate by weight is due to the large amount of tires recycled. As previously stated,

these figures are preliminary and conservative. Updates to the recycling rate will be posted on ADEQ's website, www.adeq.state.az.us/waste/solid/ recycle, as additional information is received from the private waste disposal and recycling industry.



F. Historical Trend in Volumes Diverted/Recycled

A 36.6 percent increase in the total volume of material diverted occurred during the FY 1998[47]. This figure will change as private recycling figures, including metal and paper recyclers, are completed. Figure 3.4 illustrates the growth in the amount of material reported diverted in Arizona during the past eight years. During that period, the volume of material diverted has risen from 179,895 cubic yards to 3,558,859 cubic yards. This is an increase of 1,878 percent. During this same period, the diversion rate increased from 1.9 percent to 25.8 percent. These increases can be attributed to more and larger recycling programs and better information gathering and reporting by the recycling community.

Figure 3.4: The growth in volumes of materials diverted from landfills in Arizona. These are volume amounts, in cubic yards, that were reported by jurisdictions in ADEQ's Annual Waste Reduction and Recycling Questionnaire, and by private recyclers in ADOC's Recycling Market Development Study survey. Reporting periods changed from calendar year to fiscal year in 1996.

[47]The total amount of waste diverted for the FY 1997 was revised from 3,183,234 cubic yards to 2,605,959 cubic yards.

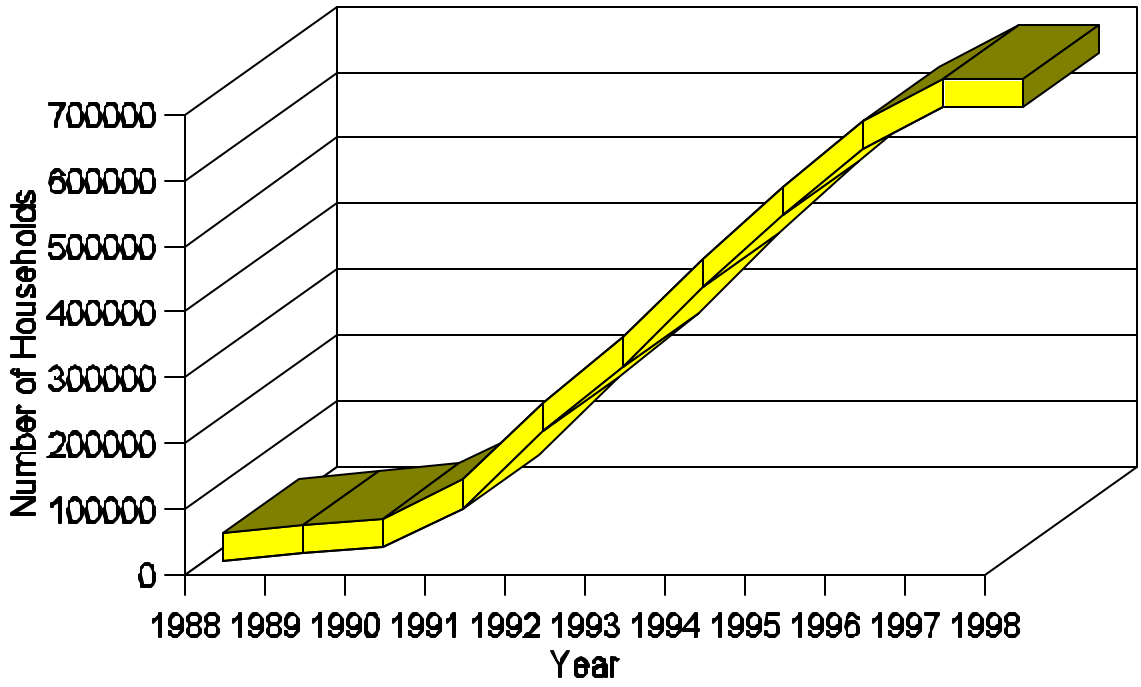
G. Residential Curbside Recycling Programs

The most convenient method for citizens to recycle is through residential curbside recycling. In most cases, a recycling bin is supplied to each household. Often, a recycling pick-up day occurs once a week and a solid waste (garbage) pick-up occurs once a week. This reduces the effort needed from each individual citizen, as compared to other types of recycling, and helps promote the recycling habit. Due to this convenience, residential curbside recycling is the major source of recyclable material collected by public jurisdictions.

A residential curbside recycling program is defined as any program that collects a variety of materials left in close proximity to their sources on a regularly scheduled basis. The program requires the collection of one recyclable material other than green waste, or white goods. Material can be collected at the curb or alley for single-family residences. Multi-family complexes are included if on-site recycling containers are provided. The recyclable materials may be source-separated, sorted at the curb, commingled, blue bag programs, or the complete residential waste stream sorted at a "dirty MRF." Scheduled collection must be at least once per month. Curbside recycling programs may be operated by large waste hauling companies, municipal solid waste management departments, and small businesses. They occur in both metropolitan and rural areas. The city of Phoenix, population 1,238,120, operates the state's largest curbside recycling program. While, the town of Jerome, the second smallest incorporated area in Arizona, population 578, operates one of the smallest.

The growth of curbside recycling is illustrated in Figure 3.5 which shows the number of households participating in curbside recycling programs by year. Though the city of Tucson had residential pick-up of newspapers for recycling in the 1970s, residential curbside recycling in Arizona as we know it today began in 1988. At that time, the city of Tempe initiated its first pilot program servicing 816 homes. Since that time, residential curbside recycling programs have operated continuously, and steadily grown in size. From 1988 to 1991, small pilot curbside recycling programs were introduced. In 1992, the town of Gilbert became the first jurisdiction to offer curbside recycling to all single-family homes. Since that time, curbside recycling has shown a rapid growth as large metropolitan cities began implementing jurisdiction-wide curbside programs. By the mid-1990s, the number of jurisdictions offering this type of recycling leveled off, while the number of households continued growing rapidly (Table 3.6).

Figure 3.5: The growth of curbside recycling. The period between 1988 and 1991 reflects the initiation of small pilot curbside recycling programs. Since 1992 the implementation of larger programs has sustained a rapid growth in the number of households being offered curbside recycling.



From 1996 to the present, low commodity prices forced collection programs in marginally profitable routes to close, thus the number of curbside recycling programs began to fall. During 1996 and 1997, the aggressive implementation of the city of Scottsdale's curbside recycling program and the expansion of the program operated by the city of Mesa kept the number of households rising. This year, however, a slight reduction in the number of households participating in curbside recycling programs in Pima County resulted in a small decrease in the total number of participating households in the state for FY 1998.

The future outlook of curbside recycling is positive, but the time of rapid growth is just about over. During FY 1999, the number of communities offering curbside recycling and the number of households participating are expected to increase as the cities and Flagstaff and Williams implement programs and the city of Phoenix completes program expansion. However, almost all of the major metropolitan cities in Arizona have instituted a curbside recycling program. The city of Glendale is the only remaining city having a population more than 100,000 which does not offer this program. Peoria and Yuma are the only other cities with populations more than 50,000 that do not offer curbside recycling.

Table 3.6: Growth in the number of jurisdictions offering curbside recycling and households having the opportunity to participate. Figures are estimates for December 31st of each year. 1998 figures are based on program status as of July 1, 1998.

Year	Number of Households	Number of Jurisdictions
1988	1,000	1
1989	13,000	4
1990	24,000	7
1991	82,000	15
1992	200,000	24
1993	298,000	29
1994	418,000	32
1995	528,000	32
1995	628,000	28
1997	692,000	33
1998	691,000	22

H. Other Public and Private Programs

Other recycling programs include commercial curbside recycling, special event curbside pick-up of recyclable materials, drop-off programs and buy-back centers. Composting has also become a major element in the state's recycling industry. These programs are offered by private companies, non-profit organizations, and public jurisdictions.

I. Summary

The response rate to the FY 1998 Solid Waste Reduction and Recycling Questionnaire was 82.4 percent. The respondents represented 98.1 percent of the state's population.

The total volume of material reported recycled or diverted from the landfills in FY 1998 is 3,558,859 cubic yards. This represents an increase of 36.6 percent over FY 1997. These are preliminary and conservative figures and continuous updates will be supplied on ADEQ's website, www.adeq.state.az.us/waste/solid/ recycle.

The volume of material diverted by individual jurisdictions are closely tied to their populations. Recycling rates for individual jurisdictions may be misleading and close investigation is required when comparing one jurisdiction to another.

The diversion rate based on volume for Arizona during the FY 1998 is 25.8 percent. This, also, is a preliminary figure and will be updated on the website.

The recycling rate Arizona during the FY 1998 is 19.5 percent based on volume, and 14.3 percent based on weight. The difference is the result of the large number of waste tires recycled. These are also preliminary figures.

There are currently 22 jurisdictions in Arizona offering curbside recycling. A total of 691,000 households have the opportunity to recycle using this method. Though this number of households has the potential to keep rising, the period of rapid growth appears nearly over.

IV. COSTS AND REVENUE

The Arizona Solid Waste Recycling Statute (A.R.S.§49-832.C.4.) requires that the following information be reported annually:

A. The costs of operating and maintaining recycling programs.

B. The revenue from the sale or use of recycled materials for existing programs.

C. The costs avoided in processing or disposal.

An analysis of the cost and revenue data reported by government jurisdictions can provide a general idea of the financial aspects of recycling programs in operation around the state. This year, 34 jurisdictions provided information regarding costs and revenues. There are insufficient data to provide a complete analysis of this issue. The challenges and issues regarding costs and revenues for recycling programs vary greatly, therefore, jurisdictions should not be directly compared. Table 4.1 provides the information reported by jurisdictions.

A. Costs of Recycling Programs

The cost of operating and maintaining each recycling program is identified in response to the Arizona Recycling Program's annual questionnaire. These costs include, when applicable: land, insurance, equipment, personnel, overhead, consultants, construction, additional procurement programs (buy recycled), and other related costs. Some jurisdictions indicated that the costs reflect several different types of recycling programs, while others stated that costs reflect a specific type of recycling program, such as funding a household hazardous waste event. Also, a jurisdiction's operational expenses may change significantly from year to year due to the purchase of capital equipment.

The data from jurisdictions who reported this information show that costs ranged from as low as $100 per year for the town of Guadalupe, to as high as $2,266,157 for the city of Mesa. The city of Tucson comes in second with $1,998,452 in operating costs, and the city of Phoenix is third with $967,078.

B. Revenues of Recycling Programs

Funds from the resale of a usable item or the sale of a recyclable item qualify as revenues of recycling programs. The greatest amount of revenue reported was $1,096,218 from the city of Phoenix. The least amount of revenue reported by those jurisdictions responding was $213 by Coconino County. The total revenue generated statewide, based on the 34 reporting jurisdictions, was $2,446,091.

C. Avoided Costs Due to Recycling Programs

Avoided costs are neither revenues nor funds received, but cost savings by diverting solid waste from the landfills. These avoided costs should be considered when evaluating the cost effectiveness of a recycling program. Avoided costs represent what would be paid to landfill, incinerate, or otherwise legally dispose of the solid waste. Typically, this estimate is based on the disposal, or tipping fees, that would have been charged had the solid waste been landfilled, but many include other landfill operation costs. For example, landfill operation cost avoidance can reflect the reduction of maintenance on landfill equipment, due to the diversion of such items as scrap metal. It is also important to consider the costs avoided for siting and constructing a new landfill, due to the landfill space saved by waste diversion.

A total of $3,113,943 was realized as avoided costs by those jurisdictions that reported such costs this fiscal year. The avoided costs ranged from $2,500 for the city of Coolidge to $1,880,359 for the city of Phoenix.

Table 4.1

Jurisdiction	Population	Operational Cost dollars	Revenue dollars	Avoided Costs dollars	Volume Diverted cu yds
Casa Grande	22,015	$211,349.00	$75,500.00	$13,924.00	3,537.95
Chandler	154,635	$1,364,760.00	$14,468.00		38,584.89
Cochise County	118492	$20,000.00	$711.00		5,211.14
Coconino County	118379	$1,471.00	$213.00		12,987.97
Coolidge	7206	$911.00	$1,869.00	$2,500.00	212.53
Cottonwood	6916	$31,313.00			2,269.92
Flagstaff	58300	$192,656.00	$39,360.00	$28,238.00	3,698.83
Gila County	47083		$6,777.00		12,456.04
Gilbert	83370		$20,835.00		17,608.80
Glendale	198660		$145,688.00		5,550.18
Graham County	33263	$58,764.00			6,376.96
Goodyear	13090	$11,114.00			336.94
Guadalupe	5440	$100.00	$400.00		360.39
Holbrook	5532		$12,500.00		2,910.13
Lake Havasu City	41362	$255,000.00	$88,893.00	$32,743.00	4,759.47
La Paz County	19310	$53,559.00			156.25
Mesa	365800	$2,266,157.00	$213,731.00	$458,663.00	62,950.96
Peoria	85245	$173,035.00	$1,216.00	$5,573.00	808.67
Phoenix	1238120	$967,078.00	$1,096,218.00	$1,880,359.00	212,298.94
Pima County	817851	$610,568.00	$30,820.00		288,142.28
Pinal County	153079	$212,577.00	$5,548.00	$19,205.00	9,014.13
Prescott	32806	$199,333.00	$18,856.00	$48,741.00	2,806.74
San Luis	10408	$3,000.00		$7,100.00	5,926.09
Santa Cruz County	36650	$15,000.00	$1,475.00		82.57
Scottsdale	192010	$844,000.00	$377,000.00	$370,000.00	53,099.71
Sedona Recycles	9660	$68,500.00	$47,000.00		4,122.04
Sierra Vista	39428	$73,450.00	$8,173.00	$58,845.00	11,946.55
Snowflake	4375	$3,000.00			0.00
Somerton	6426	$1,400.00			0.00
Tolleson	4435	$800.00			54.55
Tucson	461001	$1,998,452.00	$233,840.00	$173,895.00	44,802.63
Wickenburg	5045	$40,000.00			400.00
Yuma	131437	$148,000.00		$14,157.00	4,056.99
Yavapai County	143942	$25,000.00	$5,000.00		16,827.52
Total	4494121	$9,850,347.00	$2,446,091.00	$3,113,943.00	834,358.76

D. Cost/Revenue Comparison

There are many challenges when comparing the costs and revenues of recycling programs. Each jurisdiction does not offer the exact same combination of recycling programs nor financing methods for programs. Jurisdictions range from offering a variety of recycling programs to only one program. The types of recycling programs offered range from: curbside to drop-off collection, household hazardous waste collection year-round to individual events, greenwaste drop-off to a curbside collection and Christmas tree to white good collections. The cost associated with each jurisdiction's recycling program may represent several programs or just one.

Some jurisdictions indicated that recycling program funding is mixed with other solid waste programs, and thus, cannot be identified specifically as recycling costs. Furthermore, debate exists regarding financial issues within the recycling and solid waste industry, due to the range of definitions of revenue, avoided costs, and operational costs. Some jurisdictions have a contract with private recycling companies to collect, sort and broker the material. As a result, these jurisdictions are not privy to financial information. The financial figures of the private companies may not be represented in this report. Other jurisdictions may operate a recycling program as well as the landfill. In such a scenario, the avoided costs of paying less tipping fees for recycled material that was diverted from the landfill may be viewed as a loss of revenue for the landfill operation and may not be reported. The cost and revenue comparison is only an approximate analysis due to the difficulty in achieving consistent statewide definitions of a recycling budget and types of programs offered. Each jurisdiction should be evaluated separately.

The cost and revenue comparison only address the financial aspects of recycling. There are also indirect savings and relative benefits that are difficult for individual jurisdictions to quantify in dollars, but should be considered in overall program evaluations. These include resource conservations, energy savings, and a reduction in pollution.

V. RECYCLING GRANTS

A. Historical Overview

Pursuant to A.R.S. §49-837.B.1-2, the Arizona Recycling Program administers a grant program that provides financial assistance or start-up money to political subdivisions, nonprofit and for-profit organizations in Arizona. Throughout 1991 and 1992, the grants were referred to as the Reduce, Reuse and Recycle Grants (3R Grants). These grants were awarded to projects that focused on source reduction of solid waste and source reduction education. In 1993, the 3R Grants were separated into two grants: the Waste Reduction Assistance Grants (WRA) and Waste Reduction Initiative Through Education (WRITE) Grants. Applications to both the WRA and WRITE Grants typically include public jurisdictions, as well as for-profit and non-profit entities. However, in FY 96, a WRA Grant focusing exclusively on household hazardous waste projects was made available only to local government jurisdictions. Also in FY 97, a WRA Grant was made available to only individuals and organizations established or residing in jurisdiction with a population of 100,000 or less.

The focus of the WRA Grant is to provide funding to projects that divert significant amounts of material from the solid waste steam, or that represent comprehensive programs designed to achieve high solid waste diversion levels including research and development projects. All projects must be related to one or more of the following: the proper disposal of solid waste, source reduction, re-use, recycling, buying recycled content products, and composting.

The focus of the WRITE Grant is to provide funding assistance to projects that promote the education of Arizona citizens concerning issues related to the proper disposal of solid waste, source reduction, recycling buying recycled content products and composting. The types of education projects may include, but are not limited to, school curricula, workshops, seminars, publications, mail outs and flyers, and mass media campaigns. The WRITE Grant projects assist ADEQ in its mandate to provide recycling education information to the public.

Since 1990, the Recycling Program awarded over 145 organizations grants totaling over $5 million.

B. Waste Reduction Assistance (WRA) Grants

1. The Fiscal Year 1997 WRA Household Hazardous Waste Grants

The Household Hazardous Waste (HHW) Grant program was established by the Arizona Recycling Program to support local jurisdiction efforts in the operation of safe, effective, and efficient HHW collection and disposal programs. Nine projects were awarded grant funds totaling $829,213 for the 1997 Fiscal Year. A number of these projects formed city/county coalitions offering more services to their residents; others implemented or expanded existing programs. As the 1997 FY came to a close, a majority of the jurisdictions requested extensions due to unforseen circumstances including, but not limited to: 1) extended contract negotiations with local businesses, 2) coordination of events, reports, etc. by multi-jurisdictional projects, and 3) staff turnover. All but one of these projects were completed by the end of FY 1998. The following is an overview of the WRA-HHW grant projects that were funded:

City of Glendale
Mr. Dave Hall
5850 West Glendale Avenue
Glendale, AZ 85301

Grant Award: $37,900
(602) 930-2611

Proposal:
The City of Glendale proposed to expand the hours of their annual HHW collection day and spring cleanup events. The annual HHW collection day event would be expanded from four hours to six hours. Residents would also be able to make appointments for curbside pick-up of items such as appliances with freon, lead acid batteries, motor oil, antifreeze, and paint during the city's two week spring cleanup event.

Assessment:
Upon the scheduled completion date for this grant, in July 1997, the city of Glendale requested, and was subsequently approved for, an extension through May of 1998. This extension allowed them to use the remainder of unused monies for the 1998 spring cleanup program, and curbside HHW pick-up service. The total volume of HHW collected during the contract period of this grant was approximately 12,620 gallons of material. This included 1,871 gallons of paint and 1,870 gallons of oil. Other miscellaneous HHW such as poisons, fertilizers, and corrosives totaled 4,337 gallons. A total of 906 vehicles attended the two spring cleanup events. Overall, this program proved to be successful for the city of Glendale and the HHW grant funding helped provide a beneficial service to its residents. The city of Glendale fully utilized its grant funding for these remaining events. The grant project was completed in May 1998.

City of Holbrook
Mr. Jerry Wyatt
P.O. Box 70
Holbrook, AZ 86025

Grant Award: $24,000
(520) 524-6225

Proposal:
The city of Holbrook proposed to hold its first-ever HHW collection day with the assistance of this grant. The proposed events would take place twice during the year. The grant would provide the 5,300 Holbrook residents with an opportunity to properly dispose of household hazardous waste materials such as batteries, pesticides, solvents, fertilizer, paint, automotive fluids and other miscellaneous wastes.

Project:
The planning for these HHW events included: 1) contracting with a licensed hazardous waste management company, 2) advertising in the local newspaper and city water bill, 3) preparation with staff and volunteers, and 4) reviewing project and safety provisions with the contractor.

Assessment:
Two HHW events were held by the city of Holbrook, the first on November 11, 1996, and the second on March 15, 1997. Each HHW event lasted five hours. The first event collected 12 drums of HHW material. The second event also had a steady participation rate. The total amount of HHW materials collected for the year include 800 gallons of oil, 1,250 pounds of paint and 30 gallons of compressed gas. Miscellaneous HHW collected were batteries and tires. Overall, this small community supported these events and expressed its appreciation of the HHW grant.

City of Mesa
Ms. Jennifer Means
P.O. Box 1466
Mesa, AZ 85211

Grant Award: $100,000
(602) 644-3673

Proposal:
The city of Mesa proposed to form a coalition with Chandler, Gilbert and Maricopa County (east valley unincorporated areas). The multi-jurisdictional coalition planned on holding three separate HHW collection events, one for each city, during the grant period. Each jurisdiction would be responsible for coordinating and hosting their own event. Residents from these communities would have the opportunity to participate in any or all of the collection events.

Assessment:

Because this was a multi-jurisdictional effort, there were unforseen challenges that arose, such as lower-than-expected participation. This prevented the communities from fully utilizing the funds. An extension was granted through May 1998 to allow for three additional events. Through the course of the contract period, seven HHW collection events were held in the three participating communities. In addition, the services of this project were available to residents of unincorporated eastern Maricopa County. More than 4,180 vehicles utilized the events and approximately 211,431 pounds of hazardous materials were collected. Of that volume, paints, oils, flammables, corrosives, oxidizers, asbestos, and mercury were the primary materials. Upon completion of this grant project, the participating communities summarized the program as successful. The proper disposal of HHW and the education related to HHW recycling and disposal has become a priority in these communities, as was stated in their final report. They have, in turn, committed to each other to allow residents from their communities to participate in each other's future HHW collection events. The city of Mesa did not utilize approximately $2,225 of the grant award, due to the lower-than-anticipated turnout.

Mohave County **Grant Award: $80,000**
Mr. Jerry Hill **(520) 757-0910**
P.O. Box 7000
Kingman, AZ 86402-7000

Proposal:
Mohave County applied for a multi-jurisdictional HHW grant on behalf of the cities of Kingman, Bullhead City, Lake Havasu City, and Colorado City. The coalition proposed four separate HHW collection events, one in each jurisdiction with the HHW collection events on consecutive days in each city.

Assessment:
Coordination of this multi-jurisdictional effort caused certain delays related to the development of intergovernmental agreements. However, Mohave County was able to successfully coordinate three HHW events in the cities of Kingman, Lake Havasu City, and Bullhead City. The types of HHW material collected at these events included flammables, corrosives, oxidizers, acids, oil, paint, and automotive batteries. Although a significant volume of HHW was received, a comprehensive total was not obtained. Because Mohave County encountered delays in the coordination of these events, as well as receiving lower than anticipated resident participation, only three HHW collection events were held, as opposed to four as stated in the proposal. Due to the cost savings of coordinating three events instead of four, Mohave County did not utilize approximately $28,500 of the grant award. This project was completed within the given contract period.

City of Peoria **Peoria, AZ 85345**
Mr. Kevin Kadlec
8401 West Monroe Street

Grant Award: $82,600
(602) 412-7288

Proposal:
The city of Peoria proposed a mobile curbside pickup service of HHW materials from residential homes twice per week. The mobile pickup service would be provided by appointment only. Peoria also proposed to co-sponsor HHW collection events with the city of Surprise and Maricopa County (west valley unincorporated areas) once-a-month throughout the contract period.

Assessment:
Due to extensive delays, such as multi-jurisdictional coordination and staff turnover, the city of Peoria requested, and was granted, a six-month extension through January 1998. During the contract period, 10 HHW collection events were held for the residents of Peoria, Surprise, Sun City, and Sun City West, with the Sun City communities being unincorporated. In addition, home pickup service of HHW materials was provided for physically challenged or home-bound residents who were unable to participate in the scheduled events. The HHW material collected through this program included antifreeze, motor oil, paint products, automotive batteries, cleaners, solvents, and pesticides. Unfortunately, there are not comprehensive HHW statistics for this program. There were, however, 724 participants at the drop-off events, and 142 participants through the home pickup service. The city of Peoria did not utilize $12,600 of their grant funding.

City of Phoenix
Mr. Charles Hamstra
101 South Central Avenue
Phoenix, AZ 85004

Grant Award: $145,000
(602) 534-2524

Proposal:
The City of Phoenix submitted a HHW proposal for a three-fold project. The first part of the HHW project was to collect batteries, oil, paint and antifreeze (BOPA) materials once a month, for 10 months. BOPA events were a new addition to the existing HHW program for the city of Phoenix. They would be held at different locations throughout the city, totaling 24 available sites annually. In addition, Phoenix planned to hold two full-scale HHW collection events. The primary HHW material accepted at these events would be pesticides, herbicides, and other household chemicals not advertised through the BOPA events. The city would also offer a door-to-door HHW collection pickup service for physically challenged residents.

Assessment:
From January 1997 through December 1997, 12 BOPA collection events and two comprehensive HHW collection events took place. Due to calender overlaps, the city of Phoenix was awarded an extension through March 1998 to complete remaining tasks.

BOPA Events

Each BOPA event was scheduled during a three-day period, usually a Thursday, Friday, and Saturday. Special needs pick up service was offered for residents who due to disability or transportation restrictions would otherwise be unable to participate. A total of 2,244 vehicles participated at the BOPA events, and there were nine special needs pickups. The volume of HHW material collected through this program alone included 568 automotive batteries, 4,835 gallons of latex paint, 44 gallons of oil based paint, 3,530 gallons of motor oil, and 502 gallons of antifreeze. In addition, 2,601 tires and 4,502 gallons of miscellaneous hazardous waste were accepted.

Full Scale Events

Two full scale HHW collection events were held in April and November, 1997. The events attracted 4,109 vehicles, representing 5,263 households. The total volume of material collected came to 85,791 gallons. This included 10,000 gallons of latex paint, 9,450 gallons of oil based paint, 6,105 gallons of motor oil, 1,044 gallons of antifreeze, and 59,192 gallons of miscellaneous hazardous materials. In addition, 680 automotive batteries were collected.

Several factors contributed to the success of such a comprehensive program. These included project management and coordination; past experience with related programs; advertising; promotion, and education. The city of Phoenix completed this grant project in March 1998, and fully utilized its grant funding.

Pinal County
Mr. Ed Pallone
P.O. Box 827
Florence, AZ 85232

Grant Award: $55,433
(520) 868-6680

Proposal:

Pinal County planned to construct a covered 30-by-60 foot cement pad for the staging and processing of HHW material. The HHW facility's planned location was at the county's Waste Tire and Recycling Facility in Florence. Proposed HHW collection was to take place twice-a-year in the following locations: Arizona City, Oracle, Dudleyville, San Manuel, Maricopa, and Stanfield.

Assessment:

This comprehensive HHW collection program provided a much-needed service to the residents of this rural county. During the term of the grant, Pinal County held six HHW outreach collection events in rural communities. In addition, the county constructed a batteries, oil, paint, antifreeze (BOPA) processing facility, which resulted in decreased disposal costs. A total of 120 vehicles participated in the outreach events. Approximately 903 gallons of HHW material, including BOPA, were collected at these events. The

primary material was paint. In addition, 148 automotive batteries were dropped off by residents. Through the tracking of HHW materials received and re-evaluation of the program, Pinal County elected to forgo the purchase of a piece of equipment. Based on this decision, Pinal County did not utilize $1,250 of grant funding. The project was completed in the allotted time.

City of Tempe
Mr. Jack Travers
31 East Fifth Street
Tempe, AZ 85281

Grant Award: $300,000
(602) 350-8200

Proposal:
The city of Tempe proposed to construct a permanent HHW collection facility. The facility would be open two to three days each week for residents to properly dispose of HHW. The facility would be staffed and managed by the city's Environmental Services Division. The city planned to build the facility on existing city-owned land, although a site had not been determined upon submittal of the proposal.

Project Status:
Because of lengthy delays due to site location approval, lease agreement negotiations, and permitting processes, the city of Tempe was awarded a one-year extension through July 1998. During the 1998 FY, the city of Tempe located a site for the permanent HHW processing facility and finalized a lease agreement with Arizona Public Service. Facility plans were finalized, permit applications were submitted, and interviews were scheduled for the hiring of new personnel. In April, the city obtained construction bids for the project, all of which greatly exceeded the architect's original estimate. The city was able to secure additional funding, which compensated for the cost difference. Upon the close of Fiscal Year 1998, the city of Tempe was approved for an additional five-month extension. It is anticipated that the facility will be completed by December 1998, and will begin accepting HHW materials in January 1999.

City of Yuma
Ms. Suzanna Hitchcock
180 West First Street
Yuma, AZ 85364

Grant Award: $16,280
(520) 343-8827

Proposal:
The city of Yuma proposed to hold four HHW collection events in October of 1996 and January, April, and July of 1997. The grant funds were to assist the city in hiring a part-

time HHW coordinator to oversee management and operations of the outreach events. The city of Yuma proposed to include the cities of Somerton, San Luis, Wellton, Fortuna Hills, and the residents in the unincorporated areas of Yuma County to participate in the HHW collection events.

Assessment:
During the 1997 FY, the city of Yuma moved the HHW Program from its Risk Management to their Public Works Department. This reorganization, coupled with innovative resource coordination, created a cost savings by the end of the contract period. The city of Yuma was granted an extension through November 1997 in order to utilize the remaining funds for an additional event. Upon completion of the fifth HHW event, a total of 62,355 pounds of material was collected during this program. Of that total, 92 percent or 56,665 pounds, was to be reusable or recycled. The items collected at these county wide events were flammables, corrosives, poisons, oxidizers, tires, paint, antifreeze, oil, and batteries. The cooperative effort put into this project proved to be beneficial to all five communities and the unincorporated areas of Yuma County. An extension to the grant allowed the city of Yuma to fully utilize its grant funding and complete this HHW project by November 1997.

2. The Fiscal Year 1997 WRA Grants

The 1997 WRA grant was available to private business, non-profit organizations and governmental agencies existing within, or servicing areas within Arizona. A total of $420,242 was awarded to 15 projects selected from the 50 proposals submitted. The grant period began on December 2, 1996 and concluded on December 1, 1997.
Of the 15 organizations awarded funding, one declined the award, one returned the award after encountering difficulty, and 13 completed their projects. Four projects were given extensions, including two six-month extensions, a four-month extension and one grant that received a total extension of eight months. All of the completed projects were within budget, and one organization saved and returned a portion of the grant funding.

The following is a brief discussion of each grant project, including a summary of its proposal, a narrative of the project, and an assessment of its performance.

Alliance Marketing Southwest **Grant Award: $64,418**
"Alliance Marketing Southwest Expansion Program" **(602) 649-2715**
Mr. Jon Hinz
639 West 2nd Avenue
Mesa, AZ 85210

Proposal:
Alliance Marketing Southwest was awarded $64,418 to expand its existing book recapture program by purchasing a medium duty delivery truck with a rail-type lift gate to facilitate pick-up of large quantities of school books from throughout Arizona. A driver/book sorter and a loader/book sorter would be hired to increase capacity. As school books become unusable, schools and school districts would contact Alliance Marketing Southwest to remove them. The books would be taken to the company's warehouse where they would be hand sorted, then sold to recapture book companies, charter schools, home schoolers, and other school districts. Revenues would be shared with the schools. Unsold books would be donated to non-profit organizations, first in the United States, and then to foreign countries. Books damaged beyond repair would be recycled for the paper content. The project would also develop awareness programs for school staff and the Arizona State Board of Education containing a video, brochures, newsletters, and a public relations packet. Alliance Marketing Southwest hoped to capture millions of pounds of educational material, and in the future, expand their program to neighboring states.

Project:
The response to the expansion was so great that the company move into a larger facility during the first quarter of the grant period. Alliance purchased a GMC T6500 truck with a 3,000 pound lift gate. During the truck's "shakedown" trip to Yuma, Somerton and Gadsden over 6,000 pounds of discards were picked up. The new truck had three to four times the carrying capacity of the unit it replaced and was more fuel efficient. The

educational materials were completed during the second quarter. At that time, Alliance was contacted by schools in Mexico and El Salvador that were interested in receiving books collected through the program. In response, Spanish versions of the brochures were produced during the third quarter for distribution in Mexico and Central America. During the grant period, Alliance Marketing Southwest retrieved discarded books from 147 schools and organizations, resold 145,028 pounds of books to recapture companies and charter schools, donated 149,070 pounds of books to 23 non-profit organizations, and recycled 440,802 pounds of white paper and 441,340 pounds of cardboard.

Assessment:
Overall, the Alliance Marketing Southwest Expansion Program was on schedule and budget. However, expenditures for particular portions of the program were shuffled across quarterly deadlines, dictating constant revisions to the task and payment schedule. The company did an excellent job in expanding the program statewide, with schools from Window Rock to Somerton and from Bisbee to Chino Valley participating. The program also reached its goal of expanding outside of Arizona, with interest in California and cities in Mexico and Central America requesting books. The book recapture program diverted 1,176,240 pounds of books, paper, and cardboard from Arizona landfills fulfilling their goal of diverting millions of pounds. The hard work and dedication of the Alliance Marketing Southwest team was rewarded as they received a 1997 Governor's Pride in Arizona Award from Arizona Clean and Beautiful and Governor Jane Dee Hull.

The Boricel Corporation **Grant Award: $66,000**
DBA Bonded Logic **(602) 812-9114**
"Cellulose Insulation Batt - Kraft Laminator"
Mr. Tod Kean
411 East Ray Road
Chandler, AZ 85224

Proposal:
The Boricel Corporation was granted $66,000 to produce a thermal and acoustical insulation batt with a vapor barrier from recycled newspaper. As Bonded Logic, the company received a patent from the U.S. Patent and Trademark Office for a new method of converting waste papers into a durable insulation product. The grant would allow the company to purchase additional equipment that would laminate a kraft paper vapor barrier to the insulation. This would allow the company's cellulose insulation to be used in place of fiberglass rolls and batts between structural building components, such as wall studs. By 2000, this project would remove 13,090 tons per year of waste paper from the Arizona waste stream. It would recycle newspaper #6, a grade of paper recovered through commingled recycling programs and not preferred as feed stock at paper mills. The new process would also increase the value of the recycled product, and expand the markets in which these products could be sold.

Project:
Due to the time frame of the grant award process, Bonded Logic was able to acquire funding elsewhere, and declined the awarded when it was presented.

The Desert Botanical Garden **Grant Award: $18,659**
"Desert Botanical Garden Composting Project and Demonstration" **(602) 941-1225**
Ms. Sherry New
1201 North Galvin Parkway
Phoenix, AZ 85008

Proposal:
The Desert Botanical Garden (the Garden) was awarded $18,659 to demonstrate a composting method appropriate and efficient for a medium-sized horticultural operation. The Garden would purchase an E-Z-Go electric cart to transport organic waste, and a chipper to mulch bulky material. On a daily basis, excess plant and food waste would be loaded into a small in-vessel mechanical composter. In three to four weeks the materials would exit the machine as compost. This material would be stored in bags and used as needed for soil amendments in the Garden. This would eliminate the need for purchased mulch. The project would impact the public's awareness of waste reduction and pollution prevention through educational signage around the gardens, and composting classes and education programs targeted to the individual homeowner. The Garden hopes to reduce the amount of their organic waste disposed of in the landfill by 36,000 cubic feet.

Proposal:
The equipment needed to operate the composting program was in operation during the first quarter of the grant. During the same time period, signs addressing home composting were installed at the Center for Desert Living, while those at the main composting site were in production. By the end of the first quarter, 20,000 cubic feet of loose green waste had been chipped and composted. During the second quarter, the finished mulch and compost was utilized in the Gardens. Two sections of a home composting class were offered to the public in April and May. By September, the fourth composting class was held, while others were scheduled for October and November. The Garden partnered with the Arizona Organic Products Committee to host that organization's annual Fall Composting Workshop. The workshop was held on November 14, 1997, in association with Arizona Recycles Day and was well-attended by the public. By the completion of the project, 3,900 square feet of mulch and 600 square feet of compost had been reintroduced back into the Garden. The Garden utilized 98 percent of its green waste on site, saving an estimated $1,500 in disposal costs annually.

Assessment:
The mulching and composting portion of the project got off to a quick start. The Desert Botanical Gardens utilized finished product in the second quarter. The project went above

and beyond its proposed education portion. Though only two classes were proposed by the Garden, they offered six. In addition, they partnered with the Organic Products Committee of the Arizona Recycling Coalition to host the Fall Composting Workshop in association with the first ever Arizona Recycles Day.

The City of Flagstaff Recycling Office **Grant Award: $9,000**
"The Salvage Source" **(520) 779-7621**
Ms. Jan Kerata
211 West Aspen Avenue
Flagstaff, AZ 86001

Proposal:
The City of Flagstaff, in partnership with the Northern Arizona Home Builders Association, was awarded $9,000 to create the Salvage Source, an inventory of construction and demolition (C & D) wastes from building and demolition sites, and leftovers and overruns stored by building industry retailers. The goals of the project fell into two broad categories. The first category was concerned with C & D waste diversion, and included the compilation of a list of materials, named *The Paper Warehouse*, that would be distributed to a network of potential C & D waste reusers, and auctions of salvaged demolition material that would be held at the sites on which they were generated. The second category of goals focused on auditing the quantities and types of waste generated at construction sites and to evaluate construction site waste disposal procedures and costs. The project would also create educational materials to help contractors and homebuilders institute reduce, reuse, and recycle practices.

Project:
Both primary phases of the project began in the first quarter of the grant period and were completed by the end of the third quarter. Four issues of *The Paper Warehouse* were produced and sent by direct mail to 736 members of the reuse network. It was also inserted into four issues of the Northern Arizona Home Builders Association newsletter. Though the Salvage Source received 21 additional listings, and positive feedback from those in the network, it did not produced sales. Likewise, the demolition auctions proved too difficult to conduct and were eliminated from the project. The construction site audits determined that 33 percent to 44 percent of the waste material generated at an average construction site could be reused or recycled. They also found that by implementing the strategies outlined in the reports and education material generated by the grant, builders could reduce transportation and tipping fee costs by 66 percent. The money saved by eliminating the auctions was reallocated toward a builders roundtable, a builders field guide, and a waste diversion seminar for home builders. The grant period was extended four months to accommodate the completion of these additional features. Articles describing the Salvage Source appeared in the *Arizona Daily Sun* and the City of Flagstaff's newsletter, *Cityscape.*

Assessment:
With the exception of the elimination of the demolition material auctions and the features that were added to replace them, the Salvage Source was on budget and on schedule. The elimination of the auctions was disappointing, as the experience and information obtained through conducting them would have been useful and transferable to other organizations. However, two reasons for the impracticality of the auctions, contractors taking possession of the salvageable materials and scavengers gleaning the prize materials from demolition sites, are indications that much of the materials generated at demolition sites were already being diverted from the landfill. This observation was supported by the material audits which noted that little of the C & D material arriving at the landfill and transfer stations was reusable. The lack of sales through *The Paper Warehouse* may have been a function of the small quantities of each material offered and the lack of available storage space to build inventories. The Salvage Source produced a detailed and extremely useful report from the material audits conducted. This report, along with the other educational material developed by the grant, will be useful to anyone interested in C & D waste reduction and recycling. Finally, the partnership formed between the city and the Arizona Home Builders Association was extremely effective. Though the coordinator from the city was resigned, the city allowed her to continue grant responsibilities. This flexibility resulted in the continuation of the project without delays or quality reduction.

The Town of Jerome
" Jerome Compost Bins"
Ms. Anne Bassett
301 Main Street
Flagstaff, AZ 86001

Grant Award: **$8,891**
(520) 634-0715

Proposal:
The town of Jerome was awarded $8,891 to initiate a municipal composting facility. The town would compost shredded brush, debris, and food wastes from kitchens, households, and restaurants. The town would build six compost bins, consisting of steel pipe frames and wire mesh walls. Metal stands would hold the bins above the ground and allow them to be turned in a rotisserie fashion. The compost facility would be housed on town-owned property, convenient to residents and restaurant owners. The compost crew would be trained using current knowledge contained in published materials and guided by local composting experts. The educational and promotional element of the project would take advantage of the town's monthly newsletter and the recycling program's cartoon character, " Ricky Recycle." Finished product would be made available for sale in recycled bags featuring additional promotional information. The goal of the town would be to divert 50 percent of its waste stream through the compost project and its current recycling program.

Project:

The plan for Jerome's composting facility was approved by ADEQ's Solid Waste Section in February 1997, and bin construction began at that time. The construction of the bins was awarded to a private contractor, rather than the town's own welding crew. Minor modifications to the bins, which involved improved construction material types and dimensions, were recommended by the contractor. The modifications would make the bins stronger, more weather resistant, and easier to use. The bins were completed during the second quarter, and the town began shredding brush in May and composting in July. The promotional and educational material needed to involve the town's residents and train the composting crew were produced by the end of the second quarter. Additional education material was produced throughout the remaining grant period. Restaurants were provided a free month of sanitation service if they joined the program and three-fourths of their staff attended a session explaining how to source-separate their compostables. Many of the restaurants took advantage of this incentive, and by the close of the grant, only three of the large restaurants had not yet joined the program. As the material generated by the restaurants was added to the compost stream, the volume of material at the facility increased dramatically. The town composted 4,481 pounds of material during the second half of 1997.

Assessment:
Though the town of Jerome completed their project on time and on budget, the many small changes to the composting program forced constant updates to their task and payment schedule. These changes included the alternative bin materials and awarding the construction of the bins to a private contractor. The town had little experience in composting and did not correctly estimated the amount of material that would be delivered to the compost site. Subsequently, the amount of time needed to rent a chipper to mulch material and the number of hours they would have to pay their compost crew were overestimated. However, the town used their funds effectively, produced creative education materials, and devised innovative ways to get local businesses involved. The program also received coverage in the area's local newspaper. The 4,481 pounds of material composted increased the town's waste diversion rate to 18 percent. Though this is below their goal of 50 percent, the program was only active for six months before the grant period expired. The program remains operating and a 50 percent diversion rate is realistic.

Lone Pine Landfill Government Financing Corporation
"Engineering and Construction of a Conveyance Drop off Center and Procurement of Compartmentalized Containers"
Mr. Karl O. Moyers
P.O. Box 565
Show Low, AZ 85901

Grant Award: $16,225
(520) 537-0366

Proposal:
The Lone Pine Landfill Government Financing Corporation (LPLGFC) was awarded $16,225 to construct a conveyance drop off recycling center at the Lone Pine Transfer Station (LPTS). The LPTS would undergo significant re-engineering to allow for this all weather facility. At least two compartmentalized containers would be purchased to complete the site. LPLGFC would work with local commercial haulers who were in the process of establishing recyclable collection programs, for material collection and transportation to local recycling processors. Private citizens, who comprise 80 percent of the transfer stations users, would also be able to use the center. The goal of the project would be to recycle 10-20 percent, or 2,500-5,000 tons, of material entering the landfill serving the White Mountain area of Arizona.

Project:
The project was placed on hold as the major material processing facility in the area discontinued operations. If a new market for the recyclable materials was found, the project would continue. The first quarter report included a detailed description of the design of the facility, the methodology and numbers used to estimate material flow, the operational costs of the facility, and public education materials. By the end of the one-year grant period, new markets for recyclable material did not become available in the White Mountain area. Therefore, the project was discontinued and the grant funds were not utilized.

Assessment:
The primary reason this project was discontinued was the constant realignments in the waste collection and disposal industry. Not only did the major processor in the area, who had constructed a dirty MRF, close, but the processor was later bought, along with the hauling company that owned it. Many other small hauling companies in the area have been acquired by the same national waste hauling and disposal company. It should be noted, however, that the existence of the dirty MRF, the in-vessel composter in Pinetop-Lakeside, and the composting operation in Snowflake offer an excellent opportunity for the creation of an integrated waste management system capable of diverting over two-thirds of the waste generated in the area. The first quarterly report is an excellent resource and is available to organizations considering initiating or expanding a recycling program.

The City of Mesa
"Green Waste Barrel Project"
Mr. Charles Bladine
P.O. Box 1466
Mesa, AZ 85211-1466

Grant Award: $75,000
(602) 644-3057

Proposal:
The City of Mesa was awarded $75,000 to expand its Green Waste Barrel Pilot Program.

The funds would be used for the purchase of 1,250 of an estimated 4,300 barrels that would be needed to expand the city's curbside green waste diversion program citywide. Mesa would provide customers with a 90-gallon, green-waste-only, barrel to recycle materials such as loose grass, leaves, plant trimmings, tree branches and prunings. The material would be picked up from each residence once each week on the same day as the home's blue barrel recycling pick up. The material would then be delivered to a private composting company. Residents would be able to purchase finished compost in bulk amounts, and by doing so, close the recycling loop.

Project:
In June 1997, green waste barrel specifications were completed and the bidding process for their purchase began. Four hundred more barrels than originally estimated were purchased due to a 25 percent savings on each barrel. The barrels acquired with ADEQ moneys were received in October 1997. An initial number, approximately 100, was delivered to households that had been placed on a waiting list. The remaining barrels were delivered to residents who requested, from November 1997 to January 1998, to be included in the program. Desert Compost™, the green waste composting division of The Groundskeeper™, was contracted to receive and compost the yard waste at a tipping fee of $12 per ton.

Assessment:
The project was completed on time and on budget. The quarterly reports submitted included information showing the growth in green waste diversion, and geographic information system (GIS) maps identifying which households were taking advantage of the program. These reports were so impressive that ADEQ uses the city's final report as a model for all other grants. By December 1997, 1,550 households were participating in the program. It was determined that for every 500 letters sent to residents explaining the program, 50 to 75 of the households opted to participate. The amount of green waste diverted increased from $3.76 tons per week in July 1996 to a high of $25.00 tons per week in August 1997. An overall peak in material was seen in the spring and summer due to the Valley's growing season. The city expects to reach its yard waste diversion estimates once the program is implemented citywide. The Green Waste Barrel Program has been so successful the city is implementing a " Pay as You Throw" program with the green waste barrel playing an integral part of each resident's solid waste removal options.

Northern Arizona University **Grant Award: $31,084**
"NAU Residence Hall Recycling System" **(520) 523-6729**
Ms. Kathleen Leonardis
P.O. Box 5639
Flagstaff, AZ 86011

Proposal:
Northern Arizona University (NAU) received $31,084 to add permanency to the

university's existing Residence Hall Recycling Program by replacing assorted trash cans with 24 permanent outdoor Pro-Tainer Mini-cycler recycling bins. The bins have multiple compartments with removable inserts that allow for the collection of multiple types of materials. Twenty-one residence Halls housing 7,000 students will be served through the program. Students will be able to place recyclables into the containers as they exit their residence halls. The containers will be serviced by the volunteers and paid staff of NAU Recycles, which will process the material at its on-campus facility. This project will allow for additional types of recyclable material to be collected from the residence halls, add convenience for students, reduce clutter inside residence buildings, and increase recovery rates substantially. The program hopes to collect a significant percentage of an estimated 417 tons of recyclables available from the residence halls.

Project:
NAU received 34 Mini-Cycler Island containers and 14 Mini-Cycler Building containers during the first quarter of the grant period. The informative decals used as signage and the 148 bin inserts were received during the second quarter. Seventy-five percent of the containers were installed and were being used by summer hall residents by the end of that quarter. By the beginning of the academic year, in the third quarter of the grant, all the containers were installed and 6,500 instructional flyers had been distributed to the regular school year residents. This signified full program's implementation. The amount of material recycled was tracked through the fall semester of 1997.

Assessment:
The project was on time and on budget. In fact, the original number of containers proposed, 24, was increased to 48 due to savings on per unit costs. Response to the Residence Hall Recycling Program was positive. Two local television interviews about the program aired, and articles highlighting the program appeared in the university newspaper*, The Lumberjack*, and the October issue of *the Northern Arizona University EnviroNews*. The program collected newspaper, aluminum cans, steel cans, glass, and plastic. The university documented an overall increase of 31 percent, 90 tons, in the amount of recyclables collected from July through December as compared to the same period from the year prior. A full year of data will be required to determine what percentage of the recyclables from the residence halls is being captured.

Phoenix Clean and Beautiful
"The Valley Shares Program"
Ms. Anne Reichman, Prior Executive Director/Dr. Kristina Allen, Present Executive Director
101 South Central Avenue, ste. 201
Phoenix, AZ 85004

Grant Award: $6,700
(602) 262-4820

Proposal:

Phoenix Clean and Beautiful was awarded $6,700 to develop a business plan for a valley-wide business materials reuse program called " The Valley Shares." " The Valley Shares" would be modeled after a very successful program serving Los Angeles County, California, known as " LA Shares." The program would divert business equipment and supplies from local landfills and make them available to nonprofit organizations and schools. The donating businesses would receive a tax deduction for the value of their donation. The items donated would be warehoused, and non-profits and schools would be able to make appointments to " shop for free." The organizations receiving items would be required to write a letter of thanks to the donating company.

Project:
The grant proposal was submitted by Ms. Anne Reichman, previous executive director of Phoenix Clean and Beautiful. Dr. Kristina Allen was appointed executive director nine months later. Due to the change in executive directors, a six-month extension was granted. The business plan was completed in January 1998. A focus group was organized and met during that winter and spring. Discussions revealed that many large corporations in the Valley already have reuse programs in place and would, most likely, not be interested in providing financial support for " The Valley Shares." Therefore, plans to locate a site for the facility were dropped and Phoenix Clean and Beautiful was encouraged to speak with the small businesses and non-profit organizations that offer the reuse services to the community. Taking into consideration the comments and recommendations of the focus group, money earmarked to develop a database was diverted to produce a video, a brochure and two questionnaires. The brochure and video highlight " The Valley Shares" concept. The questionnaires were designed to garner more information from potential donors and recipients to help redesign the program to fill a needed niche in the Valley.

Assessment:
The change in key personnel forced Phoenix Clean and Beautiful to request a six-month extension. In addition, research indicated that The Valley Shares would be competing for materials already available for reuse. Therefore, the budget was amended to allow for additional research and promotional materials. The project did produce a thorough and well-produced business plan that would be invaluable to organizations that are considering developing business materials reuse programs in their community, or taking on the implementation of " The Valley Shares" Program. At this time, Phoenix Clean and Beautiful is utilizing the high quality video and brochures to publicize the program, and the questionnaires to determine the feasibility of its implementation.

Pinal County Landfill Department
"Mobile Recycling Program"
Mr. Ed Pallone
P.O. Box 1747
Florence, AZ 85232

Grant Award: $36,399
(520) 868-6680

Proposal:
Pinal County was awarded $36,399 to expand their recycling program by acquiring equipment that will allow them to incorporate a mobile recycling unit. The county would purchase a 3/4 ton pick-up truck and a recycling trailer. The mobile recycling unit would move from community to community on a scheduled basis throughout the year. It would serve 12 communities and operate 48 to 50 weeks per year. This would allow each community to have an opportunity to recycle once per quarter. One day events will be held on Saturday mornings to draw the largest community participation. Events in larger communities would be two-day events operating on Friday and Saturday. At a minimum, the events would be announced in local newspapers and posters publicizing dates and times would be placed in public locations such as post offices, libraries, and court houses.

Project:
Pinal County requested a number of changes to its original proposed project. The purchase of a 3/4 ton pick-up was changed to a van having the equivalent hauling capabilities and price. The advantage of the van was its enclosed cargo area which could facilitate the hauling of loose paper collected through the county's office paper recycling program. The county also found that it took longer to purchase the van and trailer than anticipated. Therefore, a six-month extension was granted. This allowed time for the mobile recycling unit to make two complete rounds of the communities on its schedule. Finally, independent recycling programs began serving some communities that the county had proposed to serve. Therefore, the county changed the route of the mobile recycling unit to include additional communities having no recycling opportunities. The mobile recycling unit was put into operation in Oracle, Arizona, on October 16, 1997, collecting newspaper, aluminum and steel cans, mixed paper, and miscellaneous recyclables.

Assessment:
Though the project experienced a number of changes and was granted an extension, the county exceeded its projected service to its communities. Additional communities were able to receive service. The original one-day Saturday events were lengthened and now continue from Thursday to Tuesday. News releases announcing the events were consistently carried by local newspapers. The original proposal of posting advertisements at local public buildings was expanded to include distribution of fliers door-to-door, through elementary schools and via direct mailing. The program placed the mobile unit at each community three times, collecting 201 cubic yards of recyclable material. Amounts increased from the first round to the third round, and if quantities hold steady for the fourth round, the county can expect to collect 116 tons of material. This would be twice the amount anticipated in the proposal.

The City of Scottsdale **Scottsdale, AZ 85251**
"Library Recycling Power Cutter"
Ms. Sandy Spain
3939 Civic Center Boulevard

Grant Award: $4,600
(602) 994-7015

Proposal:
The city of Scottsdale was awarded $4,600 to purchase a power cutter for the removal of bindings from hard and soft cover publications. The power cutter would be incorporated into the library's book de-acquisition program. The first option of the program would be to reuse the publications through their resale. The second option would be to donate the books and magazines to the Sheriff's Office for the prison system, or to rural libraries and local educational institutions. Publications that could not be re-used would be recycled, the third option of the program. Their bindings and covers would be removed with the power cutter, allowing the paper within the publications to be recycled through the city's Solid Waste Division by their recycling contractor. All safety training and documentation would be provided by the city. The goal of the program would be to prevent 13,000 pounds of paper per year from entering the landfill from the city's library system.

Project:
The modifications to the work area and the installation of the power cutter were completed by the beginning of March. Personnel safety training was also completed and publications began being recycled at the city's main library during the beginning of that month. The remainder of the grant period was devoted to the operation of the power cutter, and the recycling of library publications. During the latter part of 1997, loss of personnel resulted in a significant drop in the amount of material being recycled. By the end of the grant period, new staff was trained and the program expanded to include books and magazines from the three northern branches of the Scottsdale Public Library system, thus significantly increasing the volume of materials recycled.

Assessment:
The city of Scottsdale was the only organization participating in this grant cycle which completed their project under budget. They were able to save $187 on the needed work area modifications and electrical requirements. Though start-up of publication recycling was on time, only the first quarterly report was received in a timely manner. All reports were minimal, but those that did contain quantitative data documented that the program recycled 13,210 pounds of paper. This figure represents only the months of February, March, July, August and September. There were not figures submitted for the other months.

Sun City Lions Recycling Association, Incorporated **Sun City, AZ 85372**
"Sun City Paper Mechanization"
Mr. Paul R. Gravlin
P.O. Box 1682

Grant Award: $5,000
(602) 583-9633

Proposal:
The Sun City Lions Recycling Association was awarded $5,000 to purchase two conveyors to mechanize the collection of newspaper for recycling. The Lions would purchase one high-speed towable conveyor that would enable the loading of newspaper at their main yard in El Mirage into large trailer trucks for transport to their baling operation in Phoenix. The second smaller conveyor would be truck mounted, and mobile, to expedite the unloading of their collection bins into vehicles for transport to their yard. This second conveyor would also be used as a back up to the high speed conveyor. These conveyors would make their operation more efficient, cost effective, and would allow the Lions to process a higher volume of material.

Project:
The conveyors were purchased and put to work during the first quarter of the grant period. The large high speed conveyor was used for the primary purpose of processing newspaper. In addition, this conveyor helped process cardboard, glass, steel cans, and aluminum cans. The small conveyor was held in reserve as a back-up, but was not needed as the large conveyor never broke down.

Assessment:
The project was on time and on budget. However, third and fourth quarter reports were submitted simultaneously at the end of the grant period. Though these reports were nominal, they provided information concerning the amount of material processed. The Lions were able to increase the amount of newspaper processed in El Mirage by about 10 percent. They were also able to add four new materials to their program. The amount of each type of material collected was 11,603 tons of newspaper, 204 tons of cardboard, 37 tons of steel cans, 18 tons of aluminum cans.

Sun Lakes Homeowners Association #1 Incorporated
"Sun Lakes - Recycle Expansion Project (Cardboard Division)"
Mr. James D. Graham
25601 North Sun Lakes Boulevard
Sun Lakes, AZ 85248

Grant Award: $27,516
(602) 895-9270

Proposal:
The Sun Lakes Homeowners Association was awarded $27,516 to add cardboard and kraft paper bags to the list of materials accepted by their community recycling program. The association currently operates a drop-off recycling program at the community's

clubhouse. Cardboard would be collected from the association's golf course, restaurant, real estate office, and residents who bring other recyclables to the drop-off center using cardboard boxes and brown paper bags. The grant money would assist in funding the purchase of a truck for hauling the cardboard, a compactor for more efficient storage of the cardboard, and a concrete slab for installation of the equipment. The cardboard would then be sold to and pick up by a contractor for recycling. It was estimated that 100 tons of cardboard per year would be collected through this program.

Project:
The Homeowners Association began collecting cardboard on January 9, 1997 when they received a collection bin from the contracted recycler. The truck was received by the end of the first quarter and the compactor was received and installed during the same time period. The program was publicized on the Sun Lakes television station, a front page article in *The Sun Lakes Independent* newspaper, monthly updates in the *Sun Laker* newsletter, and an article in the *Common Ground*, a national homeowners association magazine. During the course of the grant, the association also entered into verbal agreements with Walgreen's Drug Store and A-1 Golf Carts to collect cardboard from their operations.

Assessment:
The project was on schedule for its duration. In addition to the scheduled quarterly reports, the association forwarded each issue of the Sun Laker, which contains monthly updates on the community's recycling activities. There were unexpected costs in implementing the program, but these costs were absorbed by the homeowner's association. During the grant period, Sun Lakes collected 573.47 tons of material, of which 57.52 tons was cardboard. The association was paid $2,289.90 for the cardboard by their contractor. Though the amount of cardboard collected was only 57 percent of what was anticipated, the community's commitment indicates the likelihood of reaching their goal in the near future.

The University of Arizona
"Develop a Machine to Separate Bindings and Covers from Recyclable Paper"
Dr. Wayne Coates
Project Services
P.O. Box 44390
Tucson, AZ 85733-4390

Grant Award: $28,000
(520) 741-0840

Proposal:
The University of Arizona was awarded $28,000 to develop a low-cost machine to

separate the unwanted bindings and covers from books and magazines containing recyclable paper. The machine would consist of a hopper, conveying chain, cutting wheel, and cover remover. Books stacked in the hopper would be individually conveyed to the cutting wheel, where the bindings would be separated. Once the glued backing had been cut off, the unwanted covers would be removed, leaving the clean paper to be conveyed to a collection bin. The resulting machine would have four times the processing capacity of a guillotine type cutter and be equivalent in cost. The development team would also produce an educational flyer and video tape, and locate a potential manufacturer.

Project:
The project began behind schedule due to issues regarding the advance payment requested by the University of Arizona. The principal engineer graduated prior to starting this project. The principal engineer's replacement resigned shortly after being chosen. In addition the project manager, was on sabbatical for two months during the second quarter. Therefore, very little was done before June 1997. By November 1997, a working prototype had been developed. To ensure ample time was given to make final modifications and to perform extended trials to access functionality and durability, a six month extension was granted. Extended trials were completed by the end of April 1998. Additional work was needed to evaluate saw blades, optimum speed of operation, and the efficiency of the cover removal system. Further difficulties with staffing required an additional two month extension to July 31, 1998.

Assessment:
The project is not scheduled to be completed until July 31, 1998.

The City of Yuma **Grant Award: $22,750**
"City of Yuma Recycling Program" **(520) 343-8889**
Mr. Larry Knight
155 West 14th Street
Yuma, AZ 85634

Proposal:
The city of Yuma was awarded $22,750 to expand and improve its current drop-off recycling program. The city would purchase and place an additional 38 large drop-off containers that would be compatible with an automated system of collection. Increased visibility of the recycling drop-off sites would be achieved through better signage, both at each site and along major streets indicating the direction to the sites. Participation in the recycling program would be stimulated through education materials that would explain to residents how and where to recycle, and encourage businesses to incorporate recycling into daily operations.

Project:

The city of Yuma took over mechanized collection of drop-off recycling containers in November 1996. Using matching funds, the city established 30 new drop-off collection sites and added 33 new containers during the winter and spring of 1997. In February, the 38 containers funded by ADEQ were ordered. The containers arrived in April and all were placed at drop-off sites by the end of June. These containers included nine six-yard single-chamber containers for collecting cardboard, 10 three-yard double chamber containers for collecting steel and aluminum cans, and 19 three-yard single chamber containers for collecting newspaper. Signage was also installed on the containers, at the drop-off sites, and along routes to the sites by the end of the second quarter. The education material developed included: 1) an all-purpose recycling guide explaining the whats, hows, and wheres of recycling in Yuma, 2) a waste minimization unit produced for school children, 3) instructions for businesses explaining how to implement a recycling program, 4) 10 billboard signs advertising the city's recycling program, and 5) two mobile displays used at libraries and special events illustrating the 3 Rs and the recycling of household hazardous waste.

Assessment:

The city of Yuma drop-off recycling program was on schedule and on budget at all times. Final costs were slightly different than originally estimated; however, the City expended more in matching funds than the generous 83 percent which they had committed. The program expanded from 27 sites, collecting newspaper only, to 70 sites having 130 large containers collecting cardboard, newspaper, aluminum cans, steel cans, and office paper. The city program served not only its citizens, but also expanded into surrounding Yuma County areas. Material volumes decreased significantly as winter visitors left the area. Yet, an unexpected increase in material in the early fall of 1997 was credited to concurrent education efforts. The program collected 1,060 tons of material including 583 tons of cardboard, 371 tons of newspaper, 53 tons of aluminum cans and 53 tons of steel cans. This represents a 93 percent increase in these materials over the previous year.

3. The 1998 Fiscal Year Small Community Waste Reduction Assistant Grants

In August 1997, the Arizona Recycling Program awarded eight Small Community Waste Reduction Assistance (WRA) Grants, totaling $332,509. This particular WRA Grant process was directed toward any organization or individual established or residing in a jurisdiction with a population of less than 100,000. Eligible participants of this FY 1998 WRA Grant included public agencies, private businesses, and nonprofit organizations. During this time, most of these grants remained in progress. Below is a listing of the Small Community Grant projects and their status as of June 1998:

Arkay Enterprises **Grant Award: $60,000**
"Winner's Circle Soils, Inc." **(520) 536-7398**
Mr. Keith Baldwin
P.O. Box 128
Taylor, AZ 85939

Proposal:
Winner's Circle Soils, Inc. (dba Arkay Enterprises), a composting operation, provides compost products to communities within a 200-mile radius. Arkay Enterprises developed a compost of wood waste and organic/vegetative material as an option in reducing solid waste. Arkay planned to use the grant funding on the purchase of a tub grinder, development of a new compost product, and marketing of the product.

Project:
To date, the Winners Circle Soils program accomplished a majority of its goals. Arkay entered into an agreement with Stone Container Mill in Snowflake to accept wood waste. At the same time, Arkay began proceedings for the lease to ownership conversion on the tub grinder, as well as the development of a brochure for their new product line, and marketing of that line at the 1997 Arizona "Buy Recycled Expo." One of the nation's leading industry publications for composting featured a community profile for the Pinetop-Lakeside area in the fall of 1997. This coverage helped the Arkay composting project expand their retail market to include a Northern Arizona-based nursery. In addition, Arkay partnered with the local middle school on a gardening and landscape beautification project. Through this partnership, Arkay donated some of the new Winners Circle Soils product and provided an educational component to the project. This project is scheduled for completion in August 1998.

Cottonwood-Verde Valley Recycles **Grant Award: $10,000**
"Compost & Recycling Program" **(520) 639-4714**
Ms. Belle Starr
P.O. Box 1535
Cottonwood, AZ 86326

Proposal:
Cottonwood-Verde Valley Recycles (C/VVR) proposed to expand their existing plastics recycling program. The program is based in Cottonwood, and a similar program was to be implemented in Camp Verde. Recycling bins would be located in key locations in Cottonwood and Camp Verde for easy access and community encouragement to recycle. Prior to the expansion of the plastics recycling program, C/VVR planned to implement a comprehensive educational and advertising campaign. Promotion of the program was scheduled to air on radio and in print. Issues that would be addressed included: program expansion, bin location, acceptable materials, and preparation of those materials.

Project:
The goals of this rural grant appeared to be easily attainable. However, due to some circumstances beyond their control, C/VVR encountered many challenges during the first several months of this project. During the first six months, roll-off containers were placed at local grocery stores in Camp Verde and Cottonwood with signage that provided instructions on acceptable recyclable items. Simultaneously, flyers were developed and distributed, and extensive radio and print advertising took place. This promotion was ongoing throughout the contract period. In the midst of the pilot project, however, a national waste hauler purchased the locally owned hauler, with whom C/VVR had been working. The new company attempted to honor the existing agreement, but since the hauling services for this recycling program were being provided pro bono, paying customers had first priority. Although C/VVR monitored both sites diligently, they had little control over the frequency of pick ups. Unfortunately, the Camp Verde recycling site was shut down in late April 1998, due to complaints by the property owner regarding site maintenance and frequency of pick ups. In an attempt to maintain the remaining site in Cottonwood, C/VVR focused efforts on continued promotion and advertising of this site, as well as educating the public on the larger picture of how to attain source reduction. Final reporting of this program will take place in August 1998.

City of Douglas **Grant Award: $32,120**
"Recycling Upgrade & Expansion" **(520) 805-4077**
Ms. Edna Elias
425 Tenth Street
Douglas, AZ 85607

Proposal:
The City of Douglas had operated a recycling program since 1994 with an ongoing commitment to fund the program with an annual budget of $30,000. The current costs of the recycling program were exceeding upgrades that would improve efficiency and, consequently, reduce costs. With grant funding, the city of Douglas proposed to accomplish the following tasks: 1) provide containers for collection of white office paper for Douglas schools, 2) provide signage for the recycling center, 3) create educational brochures and promotional materials to increase understanding and participation, 4) install cages for materials processing, and 5) construct a building to store recyclables and reduce exposure to the elements.

Project:
According to reports submitted by the City of Douglas, several tasks were not completed for various reasons. One of the major changes that took place early in the contract period was a change in key personnel. During the first six months of this project, the city was able to accomplish the following tasks: 1) begin construction of a loafing shed at the recycling center, 2) purchase educational materials and develop bi-lingual recycling brochures, 3) hire a new recycling staff member, 4) purchase recycling bins for area schools, and 5) implement office paper and OCC recycling programs at schools, city offices, and the local hospital. The Arizona Recycling Program anticipates completion of this project in August 1998.

ECO, Inc. **Grant Award: $54,635**
"Recycling Assn. of Maricopa" **(602) 753-0723**
Ms. Maureen Scholz
42951 West Mayer Road
Maricopa, AZ 85239

Proposal:
Environmental Concerns Organization, Inc. (ECO) planned to re-open the transfer station in the town of Maricopa as a recycling collection facility in order to provide a convenient, comprehensive, and cost effective recycling program to the community. To avoid problems associated with little or no disposal options, ECO included the following goals for this project: 1) the collection of recyclable materials at the transfer stations and through a mobile recycling unit, 2) the marketing of recyclable materials through the Southwest Public Recycling Association, 3) education of the public on topics such as source

reduction, recycling, composting, county recycling programs, and waste hauling companies, and 4) the marketing and distribution of products made from recycled content materials.

Project:
This comprehensive project got off to a quick start. In just a few months, ECO was able to: 1) purchase a pick-up truck and trailer, 2) purchase recycling containers, 3) clean up the transfer station site, 4) purchase and set up a computer database to track volume and participation, network with like programs, and market recycled content products, 5) develop educational brochures, and 6) prepare for program start-up. ECO held the Grand Opening of its recycling center on the first annual "America Recycles Day" on November 15, 1997. Shortly thereafter, ECO staff attended the Arizona "Buy Recycled Expo" to promote their newly formed program. Due to the small size of the rural community, ECO was extremely successful in scheduling local outreach events and getting coverage in area newspapers. As a result, they received more recyclables than anticipated and are looking at ways to handle the ever-increasing volume of materials. ECO staff found that, due to an inadequate volunteer base and the now-limited number of containers, they were unable to implement the mobile recycling unit. Because of this setback, some area businesses and a few remote Pinal County communities were not receiving the same recycling opportunities as their neighbors. In order to address these needs, ECO proposed to reallocate cost savings toward the purchase of additional containers, reduce the number of outreach events, since school was out for the summer, and put more energy into the implementation of the mobile unit. ECO requested an extension of the grant project. These requests have been approved by ADEQ with an anticipated completion date of November 1998.

Norton Environmental, Inc. **Grant Award: $60,000**
"Flagstaff Glass Pulverizing System" **(216) 447-0070**
Mr. Louis Perez
6200 Rockside Woods Blvd.
Suite 105
Independence, OH 44131

Proposal:
A new Material Recovery Facility, being designed, built, and operated by Norton Environmental, was scheduled to open in the spring of 1998. After completing a market overview, the city of Flagstaff's Recycling Office approached Norton Environmental to develop a more aggressive glass recycling program. Glass recycling has been difficult to maximize in Arizona due to poor market economics. In order to market the glass, it must be pulverized. Norton Environmental planned to implement a complete pulverizing and screening system for glass with the following benefits: (1) expand the life of the landfill through recycling, (2) provide a local market source for recycled glass, (3) increase economic development for the community, and (4) provide cost savings to local sand and gravel companies.

Project:
Due to the scope of this project, the potential regional impact, and the public/private partnership, there have been extensive delays on project finalization. Norton Environmental continued to be diligent in working through various local issues. Toward the end of the 1998 FY, limited but crucial progress was made. Norton is anticipated to request a grant extension.

Palo Verde Valley Disposal Service **Grant Award: $48,855**
"Southern La Paz County Cooperative Recycling Program" **(800) 922-2278**
Mr. Gordon Beers
14701 South Broadway
Blythe, CA 92225

Proposal:
Palo Verde Valley Disposal Service (PVVD) proposed to facilitate a project supporting local communities of southern La Paz County through the implementation of a waste reduction program. With the formation of such a comprehensive local program using existing public and private resources, the project would enhance maximum feasible waste diversion levels. This program planned to accomplish the following: 1) establish a permanent and convenient recycling system for permanent residents, 2) establish recycling opportunities for seasonal visitors, 3) reduce landfill disposal, and 4) create potential revenues from the sale of recovered materials.

Project:
This comprehensive waste reduction project was awarded to PVVD, which is located in Blythe, California. Blythe borders western Arizona, specifically southern La Paz County. PVVD outlined a region-specific, waste reduction program that would affect both residents and business people in the region. Along with a standard estimate of waste generation and recycling potential for the 7,000 residents of Quartzite, Salome, Wendon, Bouse, and Ehrenberg, the company projected the same statistics during the winter months, when the region's population typically peaks at over 250,000 residents. A recycling program was then implemented, along with the development of an education and public outreach campaign. This campaign covers everything from a Master Recycler course, offered through the University of Arizona Cooperative Extension, to partnering with local chambers of commerce, to forming a coalition with the local economic development offices. In addition, job duties were revised for the education outreach coordinator and community coordinator to include waste reduction and recycling education. A media campaign was developed and a recycling newsletter established. A county wide school recycling program has been implemented and field trips are offered for residents to visit the regional landfill and the PVVD recycling center in Blythe. Not only has PVVD been responsible for planning, coordinating, and implementing all of these tasks, but they have also had to monitor the program's progress and track waste diversion statistics. A final report will be submitted upon completion of the project in August 1998, and will provide

a comprehensive overview of the program's challenges and successes.

Sierra Huachuca ARC, Inc. **Grant Award: $56,429**
"SHARC Recycling" **(520) 458-4611**
Mr. Mario Gonzales
120 North Sixth Street
Sierra Vista, AZ 85635

Proposal:
Sierra Huachuca Association of Retarded Citizens (SHARC) is a non-profit social service agency providing work for people with developmental disabilities. The agency has two recycling centers and provides jobs for 40 people to recover various quantities and qualities of paper, aluminum, and steel cans throughout Cochise County. The agency proposed to increase the collected volume of recyclables to 15 percent and increase the processed product from their workshops to 20 percent over the period. The purchase of new equipment to replace and supplement existing equipment would allow the agency to accomplish the project goal.

Project:
Due to a delay in advance payment approval, this project began a few months off schedule. Once payment was not an issue, SHARC ordered a forklift and a truck. In an effort to maximize resources, SHARC was able to locate two used balers for the price of one new baler. The agency approached the Arizona Recycling Program for approval of this purchase and, upon approval, added the second baler to its recycling operation scheduled to expand in Benson. Between the two sites, SHARC processes newspaper, old corrugated cardboard, sorted white ledger paper, aluminum, and steel. This organization has been proactive throughout Cochise County and recently agreed to handle recycling for the town of Benson.

City of Yuma Parks & Recreation **Grant Award: $10,470**
"Back Yard Composting Program" **(520) 343-8680**
Mr. Roger Blakeley
1793 South First Avenue
Yuma, AZ 85364

Proposal:
The City of Yuma determined that approximately 10 to 25 percent of the estimated 400 to 500 tons of solid waste going to the landfill annually was yard or green waste. In efforts to reduce the amount of solid waste going to the landfill, the city planned a community education program for backyard composting and anticipated providing up to 500 homes with backyard composters. The goal was for homeowners to recycle their yard waste back into their property, thus eliminating it from the waste stream. The city of Yuma planned to reduce the overall percentage of solid waste going to the landfill and provide a year-long

education program to end with the Earth Day outreach events in April 1998.

Assessment:
Yuma Parks & Recreation completed the project prior to the contract period expiration date. During the course of this project, Yuma Parks & Recreation was successful in purchasing the necessary compost bins and backyard composting how to books, and offered two composting education classes. News releases were distributed throughout the community promoting the concept. Overall, the program proved to be beneficial in Yuma's efforts to reduce solid waste. Comment cards were provided at each class. Of those completed and returned, overall, residents praised the program. Due to the nature of this project, there are not waste diversion statistics. Yuma Parks & Recreation did not utilize $994 of grant funding.

4. The 1998 Fiscal Year WRA Grants

The Arizona Recycling Program awarded $599,616 for the 1998 FY Waste Reduction Assistance (WRA) Grants. From the 55 submitted WRA proposals, 14 projects were awarded funding. The grant contract period began in March, 1998, and will end in March, 1999. The following is a brief description of the WRA Grant projects that were awarded funding.

EnviroSand Inc. **Grant Award: $75,000**
"Buy EnviroMill Machine" **(602) 273-7000**
Mr. Dave Columb
P.O. Box 9519
Scottsdale, AZ 85252

Proposal:
EnviroSand (formerly, ACF Services) is a newly formed company designed to provide glass recycling services in the Phoenix metro area. The goal of this project is to purchase a glass processing machine and establish a customer/client relationship with public and private entities throughout metro Phoenix. Extensive background and marketing research has taken place over the last year to determine the feasibility of developing such a program in Arizona. Long term projections indicate that up to 40,000 tons of glass can be diverted each year from area landfills. At the time of the proposal, there were not any in-state glass recycling operations. Therefore, EnviroSand will help serve the need for Arizona-based glass recyclers.

Arizona State University **Grant Award: $29,891**
"Technology of Crumb Rubber Composites" **(602) 965-2745**
Dr. Han Zhu
P.O. Box 871603
Tempe, AZ 85287-1603

Proposal:
Waste tire disposal has long been a challenge in the state of Arizona with five to six million tires disposed of yearly. Currently, there are some applications in place that recycle the crumb rubber made from processed tires, such as rubberized asphalt and various types of garden equipment. This project focuses on research and development of additional crumb rubber applications. Arizona State University will be doing various tests regarding its light weight, strength, non-catastrophic failure patterns, and slow aging process. Potential impact of crumb rubber technology development may be regional, if not national.

City of Williams **Grant Award: $57,135**
"Commercial & Residential Trash Containers/ Curbside Recycling" **(520) 635-4451**
Mr. Joe Duffy
113 South First Street
Williams, AZ 86046

Proposal:
The City of Williams is going to implement a comprehensive curbside recycling program for its residents, as well as commercial vendors. Currently, there is not a recycling program in place, but through a cooperative effort with the materials recovery facility scheduled to open in Flagstaff, collection in Williams is feasible and cost effective. Grant funding will be used for the purchase of the recycling bins necessary to get the project started. In addition, the documented success of such a program can be transferred to other rural communities throughout the state.

Maricopa Association of Governments **Grant Awards: $18,880**
"Regional Recycling Information Exchange" **(602)452-5045**
Ms. Drenan Dudley
302 North First Ave., Ste. 300
Phoenix, AZ 85003

Proposal:
The Maricopa Association of Governments (MAG) is a council of governments that serves as the regional agency for the metropolitan Phoenix area. In addition, MAG has been designated by the governor to serve as the principal planning agency for the region in solid waste management. This project encompasses four goals. The first is to encourage the number and quality of recycling programs in the MAG region. Secondly, MAG plans on developing a website in order to improve the communication between public and private sectors on issues of recycling and its market development. The third goal is to update their Solid Waste Information System database and use this as a management tool. Lastly, MAG intends to develop a regional forum to facilitate joint action for diverting recyclables from the waste stream and create the opportunity to educate and inform jurisdictions on solid waste management and recycling issues. Because MAG has the authority and capability to coordinate such a project, the Recycling Program believes this to be a beneficial program for communities interested in expanding or beginning recycling programs.

Tucson Iron & Metal **819 West 29th Street**
"Paper and Plastic Recycling Program" **Tucson, AZ 85713**
Mr. Gary Kippur

Grant Award: $75,000
(520) 884-1554

Proposal:
Tucson Iron & Metal (TIM) primarily processes metals. After completing local research in the south side of Tucson, this company has decided to expand their operation by accepting paper and plastic. The company plans to conduct local marketing, providing an economic incentive to the low income residents of southern Tucson to sell their recyclables. With this incentive for area residents, TIM's program would prove cost effective for both the company and the community. ADEQ funding will be used towards the purchase of a baler for this project.

Habitat for Humanity
"Construction Closet"
Ms. Carole Baumgarten
P.O. Box 43235
Tucson, AZ 85733

Grant Award: $50,000
(520) 629-0474

Proposal:
Habitat for Humanity and TMM Family Services (formerly Tucson Metropolitan Ministries), both well-known, non-profit community-based organizations, teamed together in this project. These organizations will be constructing a warehouse for the storage of donated construction materials. The large volume of material, which had previously gone to landfills due to space constraints, could potentially be stored on-site and used in the construction of homes for low-income residents. Because both organizations are well established in the Tucson area, the educational component and marketing of such a program will be easily attained.

Santa Cruz County
"ABOP Recycling Station"
Mr. Victor Gabilondo
2150 N. Congress Drive, Room 117
Nogales, AZ 85621

Grant Award: $32,500
(520) 761-7800

Proposal:
Santa Cruz County began a Household Hazardous Waste (HHW) Program in 1994, partnering with Pima County and three other southern counties to form a regional Household Hazardous Waste Program in 1997. Through the success of outreach events, residents have become more and more receptive to recycling HHW, but due to limited funding, initiating a separate program for Santa Cruz was not a possibility. With this WRA Grant, Santa Cruz County will construct a permanent collection facility for antifreeze, batteries, oil, and paint processing, and will use that facility as a marketing and

educational tool for the promotion of their program to all county residents.

Gila Ridge Pallet Company **Grant Award: $52,200**
"Pallet Waste Reduction" **(520) 726-6256**
Mr. Gary Pocock
P.O. Box 6481
Yuma, AZ 85366-6481

Proposal:
The owner of Gila Ridge Pallet Company has been in the pallet recycling business for over 14 years, with experience in pallet manufacturing dating back to 1971. Data show that pallet production is second only to the home construction industry in the use of wood, with 86 percent of pallets going to landfills. This Yuma-based operation has been recycling and repairing pallets manually and, with this proposal, plans to automate the process. This new process will increase the efficiency of pallet recycling with a potential of diverting more than 2,000 tons of wood waste from the landfill. All wood used in the repair process will be reclaimed from pallets beyond repair.

Terra Cycle Technologies **Grant Award: $65,000**
"Composting" **(520) 604-2089**
Ms. Jo Jean Elenes
P.O. Box 192
Tumacacori, AZ 85640

Proposal:
Terra-Cycle Technologies, a newly formed company, plans to start an organic composting facility in Santa Cruz County. An area study shows that over 65 percent of waste going to the county landfill is biodegradable material. This statistic is 35 percent over the national average. Terra-Cycle plans on diverting not only produce, which accounts for a large volume of the biodegradable material mentioned above, but also the produce boxes and pallets that would otherwise be dumped. The potential for waste diversion is approximately 20,000 tons of organic waste a year. This grant funding will be used toward the purchase of equipment and direct costs associated with starting up such a project.

River Cities Waste Systems, Inc. **Grant Award: $8,010**
"Boy Scouts Newspaper Drop-off Program" **(520) 855-9441**
Mr. Brian Conway
2000 West Acoma Blvd.
Lake Havasu City, AZ 86403

Proposal:

Prior to River Cities Waste's (formerly Laidlaw) arrival to Lake Havasu City in 1990, the Boy Scouts newspaper drop-off program was the only recycling outlet available to the citizens of Lake Havasu City. Over the last several years, various recycling organizations attempted to partner with the Boy Scouts and maintain this struggling collection program. The project proposal outlines the purchase of two drop-off containers, and the funds necessary for River Cities Waste to haul the material for processing. The Boy Scouts will be paid to maintain the site by monies received for the sale of the baled newspaper. This new process will make it easier for area residents to participate, reduce contamination, and increase efficiency.

Pinal County Dept of Solid Waste **Grant Award: $24,000**
"Expanded Mobile Recycling Project" **(520) 868-6680**
Mr. Ed Pallone
P.O. Box 1747
Florence, AZ 85232

Proposal:
Pinal County currently operates a mobile recycling program whereby recyclables are picked up periodically and transported from the counties many rural communities. The goal of this project is to purchase additional trailers in order to expand this operation. Pinal County plans on providing the opportunity to recycle for communities that are currently not served. In addition, the county will pick up the materials on a monthly, rather than quarterly, basis. With the amount of interest shown by area residents, Pinal County believes the expansion to be viable and necessary to the overall success of their recycling program.

The Farm at South Mountain **Grant Award: $15,000**
"Compost Demonstration Site" **(602) 965-3266**
Ms. Diann Peart
6106 South 32nd Street
Phoenix, AZ 85040

Proposal:
The Farm at South Mountain operates an organic garden (including a pecan grove), a sandwich shop, a fine dining restaurant, and a composting site in South Phoenix. This grant will allow The Farm to expand its current composting facilities, establish a compost demonstration site, do commercial marketing of their compost, and develop a new brochure with a complete overview of the expanded project. Partial funding is being offered for a full-time compost coordinator and some direct costs associated with expanding the compost facility. The long term goal of The Farm is for this project to become self sustaining upon completion of the contract period.

Friedman Recycling **Grant Award: $39,000**
"Arizona Small Business Recycling Project" **(602) 269-9324**
Mr. David Friedman
3640 West Lincoln Street
Phoenix, AZ 85009

Proposal:
Friedman Recycling, the oldest and largest independent paper recycling company in Arizona, conducted research on the small business community and its recycling efforts. Currently, Arizona small businesses generate over 200 times more waste than Arizona big businesses. Friedman proposed to develop the Arizona Small Business Recycling Project. This project will offer no-cost, start up, recycling programs to small businesses who, without the assistance of the Recycling Program, would otherwise not be able to support a recycling program. The long term estimate is for a diversion rate of approximately 2,700 tons of material each year. Funding is requested for the purchase of recycling bins, which will be made available to businesses interested in participating. Extensive marketing and education are incorporated into this project.

Growers Market, Inc. **Grant Award: $58,000**
"Maximum Diversion of Green Waste" **(602) 992-5457**
Mr. Neal Brooks
P.O. Box 30277
Phoenix, AZ 85046

Proposal:
Growers Market is a well established composting operation located in metropolitan Phoenix. The Growers Market president has been in the green industry for 23 years, and has realized the potential of green waste diversion, both economically and environmentally. Since 1996, Growers Market Recycling has diverted approximately close to 12,000 tons of green waste. Through marketing and research efforts, this company has received long term commitments from several landscape related operations to have their green waste routed to Growers Market for composting rather than taking it to the local landfill. The projection is for an immediate diversion of 70,000 yards of organic matter, which equates to 52,500 tons. Growers Market Recycling will receive funding for the purchase of roll-off containers needed to collect the large volumes of green waste at each of the landscape sites. This project alone could increase the state recycling rate by 1.3 percent.

C. Waste Reduction Initiative Through Education (WRITE) Grants

The FY 98 Waste Reduction Initiative Through Education (WRITE) Grants were available to governmental entities, private industry and non-profit organizations. The Arizona Recycling Program awarded the WRITE Grant funding of $222,485.50 to 12 recycling education projects. The grant period began in August 1997 and will conclude in August of 1998. Each grant is described as outlined in its proposal. To provide a status report for each grant, each description has then been updated to reflect the actual activities conducted as of June 1998.

Agua Fria-New River Natural Resource Conservation District
"The Earthworm Tunnel"
Ms. Kathy Killian
3150 N. 35th Avenue Suite 7
Phoenix, AZ 85017

Grant Award: $14,143
(602) 379-3058

Proposal:
Agua Fria-New River Natural Resource Conservation District was awarded funding for the design and construction of " The Earthworm Tunnel," a demonstration project that would promote worm composting as a method of diverting household organic wastes and paper trash from landfills. The visiting school classes and general public would be able to walk through the tunnel to observe the soil profile, and witness the earthworms decomposing the waste while the worms turn and aerate the soil.

Project Status:
The design and construction of the " The Earthworm Tunnel," located at Duncan Family Farms, in Litchfield, is complete. The earthworm boxes, root viewing area, simulated soil wall, and soil monoliths are being finalized. The copy and artwork for the signs has been written and approved by all participating parties. The signs will help to further educate and guide the public through the tunnel while they witness the earthworms decomposing the waste. Installation of the signage, artwork, earthworms, and soil will be completed in the final stages of the project.

Duncan Family Farms will be developing the lesson plans that include suggestions for composting and recycling. When the grant project is completed, the elementary school teachers will be given this information in a curriculum packet, at the conclusion of the tour, for future lesson plans.

Arizona Clean & Beautiful **Grant Award: $11,537**
"Recycling Education in Rural Communities" **(602) 274-0494**
Ms. Leandra Lewis
1645 E. Missouri, Suite 230
Phoenix, AZ 85016

Proposal:
Arizona Clean & Beautiful (ACB) was awarded funding to develop a comprehensive educational project that would serve as a model to increase recycling through the active participation of a diverse core community group. The educational information is proposed for implementation in two rural communities. The model would include meetings with civic leaders, an evening program for the parent-teacher organization, site visits to recycling locations, a workshop for teachers, and additional activities.

Project Status:
The Recycling Education in Rural Communities program was developed from the assessment of current recycling educational activities in the communities of Kingman and the Navajo Nation, specifically Sanders. ACB worked cooperatively with their affiliate in Kingman to coordinate the first of two workshops. From February 19 to 21, 1998, the Kingman workshop was implemented to include a community leadership luncheon and educators' workshop. One of the goals of the program was to increase the awareness of local recycling efforts and the knowledge of the recycling process. Representatives from local recycling facilities assisted in the dissemination of information regarding the economics of recycling and with identifying local key contacts and resources.

The Sanders workshop is scheduled for July 1998, with the same format planned with community leaders. This grant project is scheduled for completion in August 1998.

Arizona Clean & Beautiful **Grant Award: $39,700**
"Influence Behavior Public Service Announcements" **(602) 274-0494**
Ms. Leandra Lewis
1645 E. Missouri, Suite S-230
Phoenix, AZ 85016

Proposal:
In cooperation with Dr. Cialdini and a selected Arizona State University (ASU) research team, Arizona Clean & Beautiful (ACB) proposed to set up a recycling advertising campaign for radio and television to be aired in designated Arizona rural communities. The grant funding would enable the research team to investigate the norms that influence one's decision to recycle. Prior to launching this recycling education campaign, the research team will discover the persuasive influences that are critical to public education in rural Arizona. Arizona Public Service Company plans to provide professional and technical support to produce the public service announcements. Distribution would be conducted by ACB and participating affiliates.

Project Status:
The ASU Research Team surveyed Arizona Clean & Beautiful affiliates and recycling facility managers in the designated communities to begin gathering the information needed for this grant project. By reviewing and researching the disciplines of social psychology and the persuasive appeal of mass media communication, the ASU research team developed the media campaign specifically to increase Arizona's efforts to recycle. The radio and television scripts were written and finalized to incorporate the psychology influencing human behavior. The television public service advertisements (PSAs) were filmed, edited, and reviewed for distribution. During the scheduling of the media time line, it was determined that the April through June 1998 time period was too saturated with other environmental media campaigns to get a true analysis of the effect that this campaign would have on Arizona citizens. Therefore, the grant project's time line was revised to begin airing the campaign in August 1998. A six-month extension was requested and approved by ADEQ for the implementation of the new PSA campaign schedule. Additional time may be needed to evaluate its effect on the participating communities and their recycling efforts.

Arizona Hotel/Motel Association **Grant Award: $19,300**
"Waste Reduction Education Campaign **(602) 991-3388 ext. 5312**
for the Hospitality Industry"
Mr. Paul Hayes
7500 E. Double Tree
Scottsdale, AZ 85258

Proposal:
The Arizona Hotel/Motel Association (AHMA) is a trade association representing over 560 hotels, motels, and hospitality industry suppliers throughout Arizona. The association was awarded funding to develop and implement a waste reduction education campaign targeted at Arizona's hospitality industry. The three components of the Association's project would to include the following: 1) the Waste Reduction Toolkit, which would serve as a guidebook to provide complete information on how to set-up, operate, and maintain a successful hotel and motel waste reduction and recycling program, 2) *The Good Earthkeeping Journal* would focus one of four quarterly publications on solid waste reduction, and 3) the workshop would be held to highlight speakers representing Arizona motels and hotels who have implemented waste reduction programs.

Project Status:
The AHMA involved their Environmental Committee members to assist the subcontractor, the Southwest Public Recycling Association, in completing the goals of the grant project. In April 1998, the source reduction issue of *The Good Earthkeeping Journal* was completed and distributed to the hospitality industry to promote solid waste awareness and the Waste Reduction Workshop.

On June 1, 1998, the Waste Reduction Workshop was held in conjunction with the Annual AHMA Conference at the Westin La Paloma in Tucson, Arizona. The project manager facilitated the different components of a waste reduction program to include: waste auditing, employee training, and buying recycled products. The workshop attendees were able to hear Arizona-based case studies of waste reduction programs and have their concerns addressed on how to establish future programs. A visual multi-media presentation was provided to engage the audience with the workshop information. The Waste Reduction Toolkits, containing Arizona recycling organizations and resource information, were also developed and distributed for future reference.
In distributing the Toolkits, it was determined that mailing the documents would be less effective for delivering the waste reduction message. Therefore, AHMA requested and was approved for an extension to the end of December 1998, to distribute the Toolkits at meetings and presentations. By utilizing the regularly scheduled " Inn-keeper" meetings, the project manager will travel throughout Arizona to distribute the Toolkits as a compliment to the presentations. These presentations, along with future outreach events, will be utilized during the course of the grant project to complete this distribution.

AZRC/ Organic Products Committee **Grant Award: $7,000**
" Annual Compost Workshop/Equipment Demonstration" **(602) 944-0083**
Mr. Daniel Musgrove
P.O. Box 2533
Phoenix, AZ 85002

Proposal:
The Organic Products Committee (OPC) was awarded grant funding to coordinate a workshop entitled " Composting ....Southwest Style." The workshop would promote the benefits of composting to the state's agricultural industry, potentially the largest user of compost. A guidebook would also be developed as a result of the grant funding for attendees of the workshop to use as a future resource.

Project Status:
At the beginning of the project's time line, OPC set up planning meetings to assign the project tasks to small subcommittees. Assignments included the guidebook's layout and design, public notification of the workshop, and administration of the project. The promotion of the workshop included a combination of postcard and brochure mailings utilizing the Arizona Recycling Program's mailing list, combined with the Arizona Recycling Coalition's mailing list. The hotel arrangements were secured in the first phase of the project's time line. The guidebook was designed to incorporate the speakers at the workshop, vendor attendance information, and resource listings of equipment companies and technical assistance groups.

The two-day workshop, held on April 20 and 21, 1998, included technical seminars and informational presentations. The workshop provided a forum for educating and informing

interested municipalities, counties, private businesses, non-profit organizations, and citizens throughout Arizona and the Southwestern states regarding effective methods for recovering, recycling, and composting organic waste. An exhibit hall was designed for industry vendors to present their services, products, and messages to the attendees. OPC distributed the "Compost Resource Guidebook" to all attendees at the time of registration along with the agenda packets. ADEQ's director welcomed and encouraged composting efforts throughout Arizona. The workshop covered various topics that ranged from home composting to the regulatory status of composting facilities and organic labeling. On the second day, an equipment demonstration, "The War of the Machines," took place at the Salt River Landfill. The project's time line indicated completion by the end of May 1998, but a final report has not been received. Therefore, a full assessment cannot be made at this time.

Cottonwood-Verde Valley Recycles
"Educational and Informational Outreach on Recycling and Waste Reduction to Residents, Schools, and Businesses of the Verde Valley"
Ms. Joan Bourque
P.O. Box 1535
Clarkdale, AZ 86326

Grant Award: $25,000
(520) 634-6606

Proposal:
Cottonwood-Verde Valley Recycles (CVVR) was awarded a grant to coordinate recycling education to inform the residents, businesses, and schools of the Verde Valley area. The five elements of the grant project would include; 1) creating a curriculum and slide presentation for local schools, 2) staging a school play, 3) hosting one free business workshop, 4) creating weekly and monthly newspaper columns, and 5) producing associated public service announcements for the radio.

Project Status:
CVVR created a schedule for presenting the slide shows throughout the grant project while preparing for the theater project and business workshop to be implemented at a later date. To provide continuity throughout the term of the project, the newspaper editorial columns and radio public service announcements promoted reducing, reusing, and recycling, and advertised the various project events.

An eight-page, grade-specific curriculum is being used in the slide presentations including a "Fairy Mulch Mother" character to entertain students. The presentations have been given to large audiences, but a high level of interaction was still maintained with elementary students. To involve the older students, a high school contest was set up for competing schools to gather the most recyclables in the Verde Valley area for a chance to win a school dance. Handouts were designed to assist the area school teachers with recycling education. Several other printed materials provided information regarding local

recycling opportunities, and were distributed to residents, schools, and businesses. On April 3, 1998, the business workshop was held in Cottonwood and included a luncheon presentation on local recycling efforts with discussion regarding the future involvement of area businesses to sustain the community recycling efforts. In Cornville, on April 4, 1998, the theater project drew an audience of 300 area residents. The participating students created the story line and characters with the assistance of the grant project's leaders. The costumes and stage props were all made from recycled material. The slide presentations, newspaper columns, and radio announcements will continue throughout the duration of the project. This project is scheduled for completion in August 1998.

Gila County Solid Waste Department
County Recycling Grant"
Ms. Sharon Radanovich
1400 E. Ash Street
Globe, AZ 85501

Grant Award: $3,340.50 "Gila
(520) 425-3231 ext. 316

Proposal:
Gila County was awarded funding to utilize a high school group, called Global Awareness Prevention (GAP), as peer educators to travel around the county educating the children about recycling and how a landfill is operated. The presentations given by GAP would include information regarding local recycling efforts as well.

Project Status:
The project was implemented for the 1997-98 academic year. The peer educators attended a "Train the Trainer" workshop to prepare them for giving presentations involving K-12 grades. The presentations included slides of a landfill, explanations of recycling programs currently in place, and detailed information on how other products can be recycled. A handout was also developed and printed with local recycling information for future reference and for parents to utilize. Presentations continue to be given throughout the county.

Town of Gilbert **Grant Award: $2,202**
"Recycling Education Pilot Program" **(602) 503-6422**
Ms. Christine Roush
525 N. Linsay
Gilbert, AZ 85234

Proposal:
The town of Gilbert was awarded grant funding to establish a recycling education pilot program geared toward children at the preschool and elementary level. The town of Gilbert proposed to design an animated coloring book that would provide local recycling information. The coloring books would provide a visual aide and reference the pilot project. The recycling information contained in the coloring book would also help to teach children why it is important to recycle, what materials are recyclable, and how the children can do their part to help the environment.

Project Status:
The project manager developed a list of the local preschool and elementary schools in the town of Gilbert. A cover letter was compiled, which explained Gilbert's recycling program and the current education project and was distributed to the listed schools. The story line of the coloring book was created to incorporate " Debris Marie," the town's recycling mascot, who entertains as well as teaches children about recycling. The coloring book went through several changes in the story line causing a delay in the completion of the layout and artwork. The coloring books were printed later than the scheduled time line and this delay influenced the presentation schedule for the preschools and elementary schools during the 1998 school year.

With the academic year at a close, the Town of Gilbert requested an extension of the grant contract period. As an alternative, the Arizona Recycling Program recommended that presentations be made during the summer months at local recreation facilities and day care centers. The Town of Gilbert proceeded to conduct the presentations at the recommended locations with help from Debris Marie, in making an effort to continue the program and keep the grant project on track.

City of Tucson, **Grant Award: $51,385**

Solid Waste Management Department **(520) 791-5543 ext.115**
'Ravin' About Recycling!' Campaign"
Ms. Karen Wood
P.O. Box 27210
Tucson, AZ 85726-7210

Proposal:
The city of Tucson was awarded funding to hire an intern to assist the education coordinator in setting up a recycling education campaign, entitled " Ravin' About Recycling!" . The targeted audiences benefiting from the campaign would include: Tucson's curbside recycling population and residents not eligible for the curbside program, but who can participate in the city's drop-off program. The audience would also include public housing residents, small businesses, and various community groups. The recycling education campaign would include the following outreach methods: media, brochures, information sheets, technical assistance, workshops, and presentations, and the introduction of the " Recycling Raven" mascot.

Project Status:
The city of Tucson hired and trained an intern to assist the project manager with coordinating the activities of the grant project. The recycling bins were purchased and continue to be distributed to the Tucson community. The Master Recyclers Program enlisted and trained a corps of volunteers to educate the community about the local recycling activities now available. The campaign's literature was designed to include versions in English and Spanish. Curbside recycling information, small business packets, posters, and multi-family housing packets have all been completed and distributed at various events throughout the city.

Rupert, the Recycling Raven mascot, was featured in several outreach events throughout the Tucson area as a recognizable symbol of the recycling education campaign. The media campaign was utilized by a local television station with their own contribution involving the newscasters and donated air time. At this time, the campaign is in full swing, and presentations continue to be given with simultaneous radio and television announcements. In addition, the city utilized existing resources in partnership with various political subdivisions and local organizations to complete the project's tasks. The project completion is planned for August 1998.

Tucson Clean & Beautiful **Grant Award: $8,050**
" Tucson/Pima County Waste **(520) 791-3109**
Reduction Education Display
and Brochures"
Ms. Joan Lionetti
P.O. Box 27210
Tucson, AZ 85726-7210

Project Proposal:
Tucson Clean & Beautiful (TCB) was awarded a grant to incorporate and consolidate information from the various Tucson/Pima County environmental and solid waste offices. The proposed display and brochures would provide a single base of comprehensive information on waste reduction and waste management education to the public. By working together, the various Tucson/Pima County offices would ensure the display would offer accurate and uniform education material. The display would be stored at the TCB office and the staff would coordinate the scheduling of events and the use of the display.

Project Status:
The display's layout and design was discussed in several meetings involving the five Tucson and Pima County jurisdictional offices. The accompanying brochure was completed and submitted to the Arizona Recycling Program for final approval In April 1998, TC&B utilized the display for Earth Day outreach events. TCB and other participating organizations expressed their concern that the display was not structurally sound for the continual transporting and multi-use functions for which the display was originally designed to withstand. The advertising firm was asked to redesign the display to meet the needs of the grant project. This grant project's time line was originally scheduled to end in May 1998, but due to the delay in reconstruction, the completion date was rescheduled for August 1998. The photos of the re-designed display board will be submitted with the final report and an assessment of the grant project will be made.

Southwest Public Recycling Association **Grant Award: $28,018**
"Technical Assistance to Rural Arizona Communities" **(602) 264-7797**
Ms. Mitra Khazai
P.O. Box 27210
Tucson, AZ 85701

Proposal:
The Southwest Public Recycling Association (SPRA) was awarded funding to provide technical assistance to rural communities. SPRA planned to focus on increasing the recycling rate in Arizona by providing community officials, private recycling businesses and non-profit recyclers with in-depth information on the various recycling options. Direct technical assistance would be provided for rural Arizona communities and would place major emphasis on: 1) creating awareness regarding recycling efforts to increase participation, 2) developing efficient and flexible collection and processing systems, and 3) maintaining an effective marketing and transportation program.

Project Status:
In order to set measurements for determining progress, the project manager created a time line to assist 24 communities with recycling efforts throughout the project term. At the beginning of the grant project, SPRA met with an ADEQ contract manager to discuss

priority technical assistance projects throughout the state. These initial projects were determined by past inquiries from the selected communities and/or their lack of involvement in recycling activities. The project's quarterly reports have described the areas of focus that include the locations, contact names, and concerns regarding solid waste or recycling issues for the particular community. In addition, SPRA describes the technical assistance provided to these communities with recommendations to increase the recycling efforts or to initiate a recycling program.

Site visits from the ADEQ Recycling Program and phone discussions with various jurisdictions confirm that the technical assistance offered through the grant project is addressing their concerns and requests for information. The technical assistance offered by this grant project currently exceeds the number of communities for which the project was originally designed to assist. Work will continue throughout the duration of the project, August 1998, for those communities identified by the ADEQ Recycling Program and SPRA.

VMB Enterprises **Grant Award: $12,810**
"Grant Training Seminars" **(602) 433-7795**
Ms. Valerie Backus
2002 W. Highland Avenue
Phoenix, AZ 85015

Proposal:
VMB Enterprises was awarded grant funding to educate rural Arizona on the Arizona Recycling Program grant process and how to correctly submit a recycling grant application. VMB Grant Seminars would also endeavor to help attendees develop the skills needed to write a proposal and increase their opportunity to receive a grant.

Project Status:
Advertising and notification efforts were conducted by the project manager in the selected areas where the presentations were held. Notification was conducted through mailings, telephone calls, facsimiles, and newspaper advertising to over 400 individuals. While preparing the implementation of the seminars, the project manager hired a consultant to develop a slide presentation and an information packet to be distributed at the seminars.

VMB Enterprises presented Grant Training Seminars in each of the following communities: Sierra Vista, Prescott, and Holbrook. Each seminar provided information on locating various types of grant opportunities. The training sessions allowed workgroups to draft a sample grant application using past ADEQ Recycling Program WRA and WRITE Grant guidelines. Specific Request for Proposal instructions provided guidance on how to complete the required forms and give detailed explanations of budget outlines. Each seminar also featured a past recipient of the ADEQ Recycling Grant, who shared their experiences of the application submittal process and oral presentation. The

time line of this grant ended in May 1998 with the completion of all tasks outlined in the original proposal. The final report was submitted in June 1998.

Assessment:
As originally proposed, VMB Enterprises presented three grant proposal training seminars in rural or remote areas of Arizona. Several of the attendees completed the seminar evaluations, and provided responses in regards to the benefit of the seminar, quality of instruction, and future recommendations for similar training sessions. Over 85 percent of the survey responses indicated that the attendees felt more confident in successfully applying for a grant.

VMB Enterprises indicated that the Arizona Recycling Program's recycling coordinators mailing list was used in their notification efforts along with advertisements in local newspapers and follow up phone calls and faxes. As described by the project manager in the final report, the attendance at the seminars was lower than anticipated. Due to the high cost of advertising in the local newspaper, VMB Enterprises was not able to advertise the seminars as much as planned. The newspapers did post the dates and locations of grant training seminars in the " Events Schedule" at no cost.

VMB Enterprises went beyond the efforts outlined in the proposal and attempted to present a fourth seminar with remaining monies. The advertising was conducted and an April 1998 seminar was scheduled in Apache Junction to reach individuals in eastern Maricopa County and western Pinal County. With a lack of response from those communities, VMB Enterprises decided to cancel the seminar.

In the final report, VMB Enterprises commented on the low attendance, but also concluded that the grant proposal training was provided to rural areas of Arizona where prior training had not been provided before. The Recycling Program staff did attend the seminar in Sierra Vista and received many positive responses to the availability of the grant proposal training. A " Grant Writing Seminar" booklet resulted from the grant project as a seminar education tool and the information is accessible through the ADEQ Recycling Program.

VI. PUBLIC EDUCATION

Since 1990, non-profit organizations, private companies, governmental agencies and the general public have benefited from the public education offered by the Arizona Recycling Program through the direct or indirect effect of recycling and source reduction workshops, the demonstration of products made from recycled commodities, and the distribution of literature that has increased recycling education and awareness throughout the state.

In addition to the 12 Waste Reduction Initiative Through Education (WRITE) grant-funded projects that are described in Section V., C., the Arizona Recycling Program administered various recycling education projects from July 1997 through June 1998. To implement the goals of the Public Education Section, A.R.S. §49-833 B. of the Arizona Recycling Program statute, requirements were developed to guide the Recycling Program staff in their recycling education and awareness efforts. These requirements are outlined below.

The Arizona Recycling Program focuses on public education for the ultimate goal of influencing human behavior to properly reduce and dispose of solid waste and to encourage the participation of source reduction, reuse, and recycling. Although the basic structure of recycling education is often centered around the hierarchy of reducing, reusing, and recycling (3 Rs) solid waste, the Arizona Recycling Program also identifies waste reduction techniques to clarify the 3Rs. These techniques include educating the citizens of Arizona to buy products made from recycled materials, to properly dispose of household hazardous waste, to compost organic matter, and to stop illegal dumping. Therefore, when the Arizona Recycling Program communicates the importance of recycling, it is an all-encompassing term that is represented as a solid waste management option with the ability to conserve our natural resources, to reduce the need for new landfills, and to create economic support to the recycling industry.

A. Provide Advice and Consultation to Persons, Businesses and Manufacturers on Recycling and Source Reduction Techniques.

During Fiscal Year 1998, the Recycling Program staff provided advice and technical assistance to jurisdictions, businesses, and the general public through the distribution of literature, including " how-to" guides and case studies of specific recycling and source reduction programs. Consultation was provided through formal and informal presentations at schools and businesses based on their desire to establish a recycling program.

The Arizona Recycling Program is responsible for coordinating statewide public education efforts to increase recycling awareness. The structure of the state's recycling efforts are community-based. If a jurisdiction offers recycling as an option to their solid waste management system, the specific logistics of that system are usually coordinated by that jurisdiction. Several non-profit organizations utilize volunteer staff to operate a drop-off recycling program. If a jurisdiction does not have the infrastructure to establish a recycling

program for residents and/or businesses, private companies specializing in a certain commodity may be another alternative for establishing recycling efforts.

In order for the Arizona Recycling Program to provide specific information to the general public in regards to community-based recycling programs, program staff communicates with designated Recycling Coordinators of each jurisdiction. The Arizona Recycling Program works with the recycling coordinators throughout the state in a variety of situations, by sharing information about similar obstacles other communities are facing in their recycling efforts and exchanging knowledge of new recycling opportunities that are available.

To increase the efficiency in gathering recycling information for a particular community, the Arizona Recycling Program updates and maintains a listing, entitled " Public Recycling Program Coordinators List." This list provides a point of contact for 102 jurisdictions throughout Arizona. Whenever the public makes an inquiry, the Arizona Recycling Program provides a general overview of statewide recycling efforts and how it correlates with their community's efforts. Source reduction options and local recycling activities are explained to the public and literature is included in the response. To ensure that any and all community-specific information is provided, the Recycling Program encourages the public to call the designated Recycling Coordinator for their jurisdiction. This information may include: pick-up days, new locations for drop-off recycling, and recycling educational programs.

When curbside recycling programs are not available to residents, the Arizona Recycling Program advises the public to create their own system of collecting recyclables and locating a nearby drop-off location for recycling. In addition to working with their recycling coordinators, residents are encouraged to call 1-800-CLEANUP to locate the closest drop-off location for recycling. Businesses looking to establish a recycling program have called the Program to get advice on how to set up internal recycling programs. The Arizona Recycling Program visited these businesses to discuss recycling options and the process of locating waste haulers.

During FY 1998, an additional listing was designed to keep track of the household hazardous waste (HHW) programs that are coordinated by the 102 jurisdictions. In some cases, these HHW programs provide a one or two day event for the residents to bring used paint, motor oil, antifreeze, batteries, household cleaners, tires and pesticides to a centralized location for proper disposal. The HHW is then separated into different areas for either reuse or proper disposal in a designated hazardous waste landfill. Several of these programs were supported by grant funding during FY 97 and FY 98 and are described under Section IV., " Recycling Grants" .

The Arizona Recycling Program receives numerous phone inquires regarding the proper disposal of HHW. If jurisdictions do not have a HHW program in place, the Arizona Recycling Program staff recommends other waste reduction and reuse options. For example, old paint can be donated to neighbors, theater groups, or beautification projects

that use old paint to cover up graffiti. Used oil and antifreeze can be returned to most automotive parts and supply stores. The Recycling Program has advised businesses with larger quantities of batteries, fluorescent lights, and solvent-based products of the hazardous waste handlers in the area, but recommendations are made to discuss handling and transportation concerns with our ADEQ Pollution Prevention and the Hazardous Waste Section. Businesses that collect used motor oil, batteries, old paint, etc. are cataloged by the Arizona Recycling Program.

In FY 98, site visits were made to rural areas, such as Payson, Pinal County and Queen Creek, to oversee the planning and coordination of recycling and HHW programs. While traveling to jurisdictions, the Arizona Recycling Program consulted with a variety of businesses exploring new avenues of recycling and reuse. Often, manufacturers offer a supply of products that can be reused or recycled by other companies. The Program staff includes these suppliers of products, such as old computer parts, unused fabric scraps, leftover wood pulp, as resources for re-manufacturers in the recycling industry.

Documents pertaining to the establishment of recycling or source reduction programs for businesses were developed as past grant projects. The Program staff continue to distribute the " Waste in the Workplace" guide, a how to guide that instructs businesses to perform waste audits prior to setting up a recycling program. The employer can determine the waste disposal habits of the employees and the steps of source separation for reuse and/or collection for recycling. In FY 1998, the Arizona Hotel and Motel Association was awarded a WRITE Grant to communicate source reduction techniques to their members by describing case studies of Arizona hotels and motels. A newsletter, a workshop and a guidebook were all developed as a part of this education grant. The guidebook has proven to be a transferrable resource to any institution, such as schools and government agencies.

Although all of the WRITE Grants focus on recycling education for the general public, one organization was awarded a WRITE Grant during FY 98 to provide statewide recycling technical assistance. The Southwest Public Recycling Association was awarded a WRITE Grant to provide one-on-one consultations with 24 communities, including public jurisdictions, grass-roots organizations, and recycling businesses located in rural areas of Arizona.

B. Sponsor, Co-Sponsor or Contract Technical Workshops and Seminars on Recycling and Source Reduction Programs

Arizona Recycling Program cooperatively worked with other agencies, non-profit organizations and/or grant recipients to sponsor or co-sponsor workshops and conferences as a means to provide recycling and source reduction program guidance.

Various non-profit organizations apply for financial assistance from the Arizona Recycling

Program through the WRITE Grant program to help educate the public on the benefits of recycling and source reduction efforts. The following FY 98 WRITE Grants consisting of technical workshops and seminars were implemented at various times throughout the year:

- VMB Enterprises was awarded a grant to educate rural Arizona on the ADEQ Recycling Program grant process. The purpose of the WRITE Grant was to help attendees develop the skills needed to write a proposal and increase their opportunity to receive a grant. During the months of February, March and May 1998, VMB Enterprises presented three Grant Training Seminars in Sierra Vista, Prescott, and Holbrook. The training allowed for workgroups to draft a sample grant application using Arizona Recycling Program. Specific WRA and WRITE Grant Request for Proposals provided guidance on how to complete the required forms and to give detailed explanations of budget outlines. Each seminar featured guest speakers, who were past grant recipients of the ADEQ Recycling Grant Program. The speakers shared their experiences of the application submittal process and the oral presentations.

- The Arizona Recycling Coalition's Organic Products Committee (OPC) coordinated a workshop, entitled " Composting ....Southwest Style" . The two-day workshop, held on April 20 and 21, 1998, included technical seminars and informational presentations promoting the benefits of composting to the state's agricultural industry, potentially the largest user of compost. The workshop provided a forum for educating and informing interested municipalities, private businesses, non-profit organizations and citizens throughout the Southwest about effective methods for recovering, recycling and composting organic waste. An exhibit hall was set up for industry vendors to present their services, products and messages to the attendees. OPC disseminated the " Composting Resource Guidebook" to all attendees at the time of registration with the agenda packets. In addition, a composting equipment demonstration, " The War of the Machines," took place at the Salt River Landfill.
- The Arizona Hotel & Motel Association (AHMA) was awarded a grant to conduct a waste reduction education campaign targeted at Arizona's hospitality industry. The AHMA is a trade association representing over 560 hotels, motels and hospitality industry suppliers throughout Arizona. The AHMA worked with the Southwest Public Recycling Association to complete the goals of the grant project. One of those goals was to create awareness through a " Waste Reduction Workshop" held in conjunction with the Annual Arizona Association of Hotel and Motel Conference. On June 1, 1998, the " Waste Reduction workshop" was held at the Westin La Paloma in Tucson. The project manager's presentation of waste reduction programs included tips and on waste auditing, employee training, and buying recycled products. Approximately 50 people attended the workshop and were able to hear Arizona-based case studies of waste reduction programs. A multi-media presentation was provided to engage the audience with the workshop

information. The " Waste Reduction Toolkits" were also developed and distributed for future reference of Arizona recycling organizations and resource information.

- Cottonwood-Verde Valley Recycles was awarded a grant to coordinate recycling education activities to educate and inform the residents, businesses and schools of the Verde Valley. One of the five elements of this grant project included a free business workshop. On April 3, 1998, the business workshop was held in Cottonwood, and included a luncheon presentation on local recycling opportunities. Sedona Recycles presented a demonstration on how to implement small business recycling programs for " office-pack" recycling. Cottonwood-Verde Valley Recycles also facilitated a discussion to encourage the future involvement of area businesses to sustain the recycling efforts of the community.

Buying products made from recycled material is a form of source reduction. Therefore, the Arizona Recycling Program worked in conjunction with the Arizona Department of Commerce (ADOC) to promote the use of recycled products made and/or distributed by Arizona-based companies through industry exhibits and educational workshops. The ADEQ Recycling Program sponsored the 2nd Annual " Buy-Recycled Expo," in November 1997, by contracting with ADOC to coordinate the Expo. Technical sessions included presentations from companies that re-manufactured products and also handled the marketing of those products. Other workshop sessions highlighted companies that instituted buy-recycled programs for the purchase of all or most of the administrative needs. (See Section D.)

C. Administer a Recycling and Source Reduction Database and Hotline Providing Referral Services to Waste Generators

As stated in A.R.S. §49-833, B. 3, the Arizona Recycling Program is required to administer a recycling and source reduction database and hotline that provides referral services to waste generators. Since 1990, the Arizona Recycling Program staff has been compiling information for a database of recycling facilities and drop-off locations for Arizona citizens to refer to for their recycling needs. Developing, updating and maintaining a database has been an on-going project for the Arizona Recycling Program staff. In the past, outreach events have been the major avenue for acquiring information on existing recycling facilities and their locations. The Arizona Recycling Program also works directly with the Arizona Department of Commerce to get updates on any new facilities that have recently located to Arizona.

In FY 1998, a database was developed by the Arizona Recycling Program to merge several different lists and resources for easier access by the Program staff. This database structure will be used for different purposes, but the foremost goal is to provide regular updates on drop-off locations and recycling facilities for inclusion on the Environmental Recycling Hotline.

From 1992 through 1997, the ADEQ Recycling Program worked with Cleanup Inc., d.b.a. the Environmental Recycling Hotline, to utilize the 1-800-CLEANUP phone number as the recycling and source reduction database and hotline that provides referral services to waste generators.

Over the years, the Arizona Recycling Program supported the Environmental Recycling Hotline in many ways. In 1992, a Memorandum of Understanding initiated Arizona as the first state to support the " Environmental Recycling Hotline" phone number and its concept of empowering the public with the tools necessary to locate recycling drop-off locations, and have access to environmental tips regarding source reduction, reusing and recycling. Initially, the Arizona Recycling Program provided funding support to assist with the cost of the telephone lines.

Additional monies allowed for promotional and educational efforts for creating public awareness of the Arizona Environmental Hotline services. Subsequent funding provided for a part-time staff person at Cleanup Inc. to update the statewide recycling drop-off locations on the hotline database.

The Recycling Program incorporates the use of the Hotline when educating the public about waste reduction and recycling. Recycling Program staff distribute promotional items such as, magnets, pencils, rulers and bookmarks that all contain the Hotline's number. The items are distributed at outreach events for the public to recognize and associate the Hotline's number with recycling and environmental information. Several thousand brochures have been printed and distributed to Arizona citizens that illustrate the Hotline telephone decision tree.

The Environmental/Recycling Hotline -- History

The Hotline started as a computerized interactive phone system that provided the location of local drop-off facilities as residents entered in their 5-digit zip codes. More services were added, such as environmental information and special event messages, including Christmas tree recycling drop-off locations. Callers can access several sections of information, including the nearest recycling center, on household hazardous waste, ways to reduce, reuse, and recycle, and purchasing products made from recycled materials.

In 1995, the U.S. EPA awarded the Presidential Environmental Technology Initiative (ETI) grant funding to ADEQ to provide Cleanup Inc. with assistance in the expansion of the Hotline program nationwide. As a result, in late 1995, the name was changed to the U.S. Environmental/Recycling Hotline (Hotline) and the EPA funding provided enhanced technology to merge other state hotlines. As this nationwide expansion took place, residents in each state are able to dial the 1-800-CLEANUP phone number to receive referral services for their communities.

The public/private partnership contribution not only assisted in the technical expansion of the actual Hotline system, but also increased the availability of promotional opportunities to increase public awareness of the Hotline and the information it provides to the public. The media partners include a diverse number of mediums that have created national awareness of the Hotline phone number and web site that allows Arizona and all other states to customize information for their citizens through campaigns and special sections.

The U.S. Environmental/Recycling Hotline created a web site to allow Arizona and all other states to customize information for access through the Internet. Specific environmental numbers and hotlinks on the page can be tailored for each community. The website address is www.1800cleanup.org.

Throughout its existence, several other organizations have supported to Cleanup Inc. to form a public/private partnership that includes local and national sponsors who offer financial, technical, and promotional support. With the support of the public/private sector, this interactive phone and Internet system has grown in its capacity to operate free to the user.

In the urban and rural areas of Arizona, many com-munities do not have the opportunity to participate in residential curbside re-cycling programs. By promoting the use of the Hotline system, the ADEQ Recycling Program increased the public's knowledge of waste reduction efforts, drop-off recycling facilities that exist as an option for solid waste disposal, and the use of local companies that will take back certain HHW wastes.

During FY 98, the Arizona Recycling program provided funding for a public service advertisement campaign that aired on radio stations throughout Arizona. This promotional campaign emphasized the overall awareness of pollution prevention, recycling, and the proper disposal of HHW. The public service announcements also promoted special events, such as the Treecycle and the America/Arizona Recycles Day events.

The Arizona Recycling Program also funded the production of a video, entitled *The Official Environmental Recycling Hotline*. The video was designed to educate the public on how to use the Hotline and to encourage more communities to utilize the phone number and web site. Unfortunately, the video project wasn't complete until April 1998, and this prevented ADEQ from funding additional promotional projects for the Hotline from November 1997 until April 1998. In June of 1998, negotiations between ADEQ and Cleanup Inc. prompted the opportunity for future promotional work emphasizing the use

of the Hotline phone number and web site based on its established name.

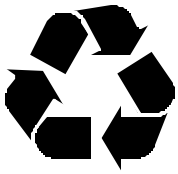
D. Promoting Recycling and Use of Recycled Products

The Arizona Recycling program staff participates in various types of presentations given to civic groups, schools, outreach events, and conferences throughout the state. Each presentation is adapted for the audience and location, but the basic message covers the concepts of reducing, reusing, and recycling.

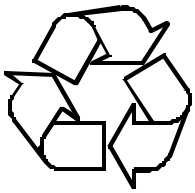
1. FY 1998 Outreach Events

The outreach events for the past fiscal year included a display booth presentation and promotional giveaways that provide visual examples of products made from recycled soda bottles, milk jugs, old tires, used paper, and cardboard. The exhibit booth presentations were conducted at the Phoenix Firebird Raceway for APS Electric Car Show, Sunday on Central, and an Earth Day event at the Tucson Children's Museum. Program staff traveled to local schools to talk with children from kindergarten through 12th grade about recycling. Recycling presentations were also given throughout the state at workshop conferences and civic groups.

Examples of recyclables are brought to the presentation to visually connect the items that the students can toss into their recycle bin. Some of these products contain the recyclable and the made from recycled material symbols. These symbols are explained to the students and pointed out on the actual products so they can assist their parents when shopping for products made from recycled material.



Recyclable



Made from Recycled Material

The presentations include interactive discussions of what their community offers for recycling and what types of items can be recycled. The audience is provided with an overall understanding of why recycling is important and how it works. Examples of recyclables are brought to the presentation to visually connect the items that the students may toss into their recycle bin. Recycled-content products are also showcased at these presentations for buying-recycled product awareness, such as carpet, made from recycled plastic soda bottles and play ground equipment made from recycled plastic milk jugs. The concept of buying recycled is also presented to emphasize that recycling includes the remanufacturing of recyclable products, and that these commodities are returned to the consumer to support the recycling industry and complete the recycling loop. In addition, promotional items, made of recycled material, are distributed to classrooms that include

rulers, pencils, bookmarks, brochures, and stickers. Most of those items contain the 1-800-CLEANUP number for reference.

The following events focused on a particular theme or goal and were coordinated with other recycling organizations and promotional groups during FY 1998. These events were promoted through a variety of ways including newsletters, public notices, and multi-media advertising.

2. Earth Day '98

The Arizona Recycling Program celebrated Earth Day '98 by traveling throughout Maricopa County and to the Sedona Recycles facility on April 22, 1998. The activities were planned and coordinated by jurisdictions and/or non-profit organizations to stimulate the public to recycle and buy recycled products. The Arizona Recycling Program visited the various locations to support the efforts of these organizations and to also contribute promotional giveaways, all of which were made from recycled material.

During March and April 1998, school presentations were conducted by Program staff at approximately 10 schools. Teachers incorporated recycling education into their curriculum prior to Earth Day to generate student interest. Many teachers contact the Arizona Recycling Program at outreach events and request presentations in advance.

3. America Recycles Day

Saturday, November 15, 1997, marked the first Annual America Recycles Day, with a national message, "Keep Recycling Working: Buy Recycled." Of the more than 100 businesses, government agencies, civic and environmental groups and associations that endorsed last year's event, the consensus was, and continues to be, close the loop in recycling by buying recycled content products. This conscious effort ensures the future economic success of recycling, thus making recycled content products a viable alternative to raw or virgin materials.

America Recycles Day, 1997, generated the interest of more than 750,000 residents from 3,000 communities nationwide to get involved in recycling events, contests, races, and activities designed to promote awareness about recycling and buying recycled content products. A total of 41 states participated in this ground-breaking call to action. People were asked to pledge to recycle by completing a pledge card with their name, address and how they would go about making a change in their daily routine. All pledge cards were forwarded to Washington, D.C., where a national drawing took place for the grand prize. This prize was the American Green Dream Home, which was a home to be constructed out of recycled content and energy efficient materials. The winner could have the home built anywhere in the United States.

Each participating state adapted the national name to fit their needs, thus "Arizona Recycles Day" was adopted by the Arizona Recycling Coalition (AzRC), Arizona's official recycling organization. The Arizona Recycling Program provided substantial sponsorship

to AzRC to plan, coordinate and promote Arizona Recycles Day activities through the assistance and expertise of a statewide steering committee. Over 30 events were held across the state, with activities such as: Boo at the Zoo in the city of Phoenix, environmental fairs in the cities of Winslow, Scottsdale, Prescott, Tucson, and Douglas, and even a recycling center's Grand Opening in the Town of Maricopa. Over 2,600 pledge cards were collected for Arizona. There were many learning experiences during the planning stages of the first Arizona Recycles Day and with that, AzRC and ADEQ plan to address challenges, call on past participants and do extensive promotion in planning a major event for the 2nd Annual Arizona Recycles Day.

4. Buy Recycled Expo '97

As part of the Arizona Recycling Market Development Program, the 2nd Annual "Buy-Recycled Expo" was sponsored by the Arizona Recycling Program through a contract with the Arizona Department of Commerce and produced by Arizona Clean & Beautiful, a non-profit organization affiliated with Keep America Beautiful. The Expo was scheduled with Arizona Clean & Beautiful's "Annual Governor's Pride in Arizona" Awards Program. The "Buy Recycled Expo", held in November 1997, was designed to promote the use of Arizona-made recycled products and showcase the manufacturers and distributors of such products. These companies set up industry exhibits and educational workshops to create awareness. The Recycling Program staff provided contract oversight and participated on the Buy-Recycled Steering Committee. In March 1997, the coordination meetings began and were held on a bi-monthly basis. The Program staff assisted Arizona Clean & Beautiful by providing contact names of state purchasing agents, recommended ideas for the conference format, and gave a presentation on the state recycling rate.

5. Treecycle '97

The December 1997, through January 1998, the Christmas tree collection and recycling project entitled, "Treecycle," involved the Arizona Recycling Program and several other partners offering an annual program entitled, "Tis the Season to Treecycle" This holiday reminder encouraged the use of the Environmental Recycling Hotline, 1-800-CLEANUP, for information regarding Christmas tree collection, and recycling drop-off locations. This year marks the fifth year for the Christmas tree recycling project, which was adopted from the city of Mesa's recycling program for its unique, yet simple method of attaching a recycling reminder to a Christmas tree. The red, tree-shaped, made-from-recycled-paper, tagged ornaments were provided free-of-charge to approximately 30 communities participating in the project. The communities distributed the tree tags to the Christmas tree retailers, who attached the ornaments to the trees. Treecycle tags reminded customers to bring the trees to a local drop-off location, where the trees would be mulched and reused in community parks.

The Arizona Recycling Program compiles annual survey information regarding statewide Christmas Tree diversion methods and results. With the contribution of the Treecycle ornaments and the use of the Hotline, there has been an increase in community

participation in collecting and recycling Christmas trees. In 1995, the Treecycle efforts diverted approximately 152,800 trees from landfills. That figure increased to 196,340 trees during the December 1996 holiday season. For the 1997 holiday season, 213,870 trees were recycled, representing approximately 2000 cubic yards of landfill space saved.

E. Administrating a Recycling and Source Reduction Research and Development Program

Research and development for recycling and source reduction projects within Arizona have been coordinated through grant projects and separate contracts. Many of the Waste Reduction Assistance (WRA) grants have produced new technology in recycling and have created future opportunities for economic development.

Several of the existing and past grants provided innovative methods of marketing solid waste for source reduction and recycling. In August 1997, Arkay Enterprises, located in Town of Taylor, was awarded grant funding to develop a compost made of wood and organic material for distribution to nearby communities. Envirosand, located in Scottsdale, was awarded grant funding to establish glass recycling and reuse for public and private entities. In May 1998, Arizona State University was awarded grant funding for research and development of crumb rubber applications beyond rubberized asphalt. Other grants provided research on a variety of different methods to reduce and recycle. (See Section 1997 WRA Grants, Section V.)

Program staff provided recycling collection facilities with information regarding newly located processing and remanufacturing businesses in the industry. For example, in FY 98, two new glass processing facilities set up operation in Arizona. The Program staff attended several seminars and corresponded with collection facilities in the area to promote the glass recycling opportunities that now exist in Arizona. Glass has been extremely difficult to market and transport in this state, as the glass suppliers and end-use markets are located are far apart, and the commodity weight makes it expensive to transport.

Recycling Program staff realize that networking opportunities increase business opportunities. Therefore, consultations with recycling businesses, waste haulers, processors, and re-manufacturers provide information regarding types of recyclables collected, sorting techniques, and the location of new markets. In a continual effort to network, the Recycling Program promotes the location of these businesses and the marketable commodities available to other sectors of the recycling industry. Meetings were held with recycling facilities that were looking to start-up or expand their collection operations. Technical assistance was also provided to re-manufacturers that needed statewide recycling statistics to determine volumes of recycled commodities.

The Arizona Recycling Program financially supports the Recycling Market Development

Program at the Arizona Department of Commerce which provides market development assistance to recycling facilities to increase their chances for success.

Currently, there are not any rules for operating a recycling facility. Therefore solid waste facility general requirements are used to monitor their practices to determine the effect on human health and the environment. In August 1997, the Recycling Program staff and the Solid Waste Program Development staff visited different material recovery facilities throughout Arizona to gain a better understanding of these facility operations for future state rules and development.

F. Coordinating a Recycling and Source Reduction Public Education and Advertising Program

There are several recycling education and awareness programs that have been implemented by communities throughout Arizona. This annual report provides data on the recycling programs offered by towns, cities and counties. If funding exists and communities have created a demand for a recycling program, jurisdictions develop their own education plan based on the structure of the community's needs.

1. Public Education Materials

The ADEQ Recycling Program continues to develop tools to offer recycling awareness for various age groups in a format that attracts their interest. For children in the age groups of kindergarten through 3rd grade, the program staff distributes coloring books that teach reduce, reuse, and recycle activities. The U.S. Environmental/Recycling Hotline [48] is continually used as a tool for overcoming the gaps when residential curbside recycling programs are not available. The Hotline offers information on drop-off locations and various environmental tips.

The Program staff acquired a clearinghouse of literature, brochures, video tapes, manuals, and slides resulting from grant projects and from state and federal agencies. The educational products that result from grant projects are required to be transferrable to other communities to incorporate in their recycling programs. Many how-to guides and manuals have been developed as a result of the grant programs are distributed by the Arizona Recycling Program upon request to schools, municipalities, non-profits, and the public. A wealth of educational and technical information is produced through the grant projects and can be applied to other communities.

It is the goal of the Arizona Recycling program to develop an inventory of the various types of educational publications and materials that are being used by the jurisdictions to promote the awareness of recycling. This inventory will provide the Arizona Recycling

[48] Featured under Administer a Recycling and Source Reduction Hotline Providing Referral Services

Program staff with an understanding of what is currently being used for the purpose of promoting recycling and what will need to be developed in the future.

The Arizona Recycling Program works with a variety of organizations that also create awareness of the ever-changing recycling industry in Arizona. The Arizona Recycling Coalition, the Southwest Public Recycling Association, and Arizona Clean & Beautiful affiliates located in sixteen communities throughout Arizona provide community-specific knowledge of economic growth in recycling.

The *Arizona Recycling Review* newsletter is a cooperative effort of Arizona State University, the Arizona Recycling Program, the Arizona Public Service Company, and the Arizona Recycling Coalition. ADEQ provided funding for the development and design of the newsletter since 1991. This quarterly publication is distributed to several businesses, organizations and agencies who have an interest in the recycling industry. The mailing list also includes all school districts and superintendents throughout Arizona. The total distribution varies due to the mailouts and promotional circulation at presentations and conferences. In an objective and professional manner, the articles provide information concerning municipal and private sector recycling programs, innovative technology, and federal and state regulatory information.

The report, " The ADEQ Recycling Program Annual Report," has been used by several municipalities, private industries, and recycling publications as a guidebook to Arizona's recycling and waste reduction programs. It has also been used to encourage recycling industries to locate in the State and to procure markets for various recyclable commodities. Recycling companies can evaluate the material flow in Arizona based on the information provided by the jurisdictions.

2. Advertising Campaigns

During April 1997, the month of heightened public awareness regarding earth-friendly activities, the Arizona Recycling Program planned a three week statewide advertising campaign utilizing advertising space in *The Arizona Republic*, *The Arizona Daily Sun, The Arizona Daily Star.* The focus of the campaign was to emphasize ways to reduce the amount of trash created through better purchasing choices. The call to action of the campaign was an emphasis on the money saved when products are bought in bulk, or when reusable products are purchased.

In a campaign to promote the use of the Arizona Recycling Emblem, the Arizona Recycling Program circulated many copies of the emblem to several communities and organizations this year by way of computer disks. The Program staff emphasized the use of the emblem for promoting recycling in education and/or marketing purposes. This state-specific emblem creates a recognizable symbol to promote recycling statewide. Continual advertisement using this emblem created a uniform look to many different recycling education documents produced by many

different organizations. The promotional items, such as rulers, pencils, pens, and stickers, that are given away at the outreach events include the Arizona State Recycling Emblem. The emblem encompasses a cactus with the three-arrowed universal recycling symbol, a double oval frame that surrounds the cactus, and bears the slogan " Arizona Cares" Reduce, Reuse, Recycle. It provides a recognizable symbol for recycling in the state of Arizona. The Recycling Program included this emblem in the printing of the promotional items and in the literature and software programs.

Newspapers, radio stations, and various of media were used through FY 98 to provide recycling information to communities statewide. A consistent message is crucial for providing a clear understanding of how recycling works and how it can work for Arizona.

G. Recommending Educational Institution Courses and Curricula and Encouraging Development of Courses in Managing Solid Waste

The Recycling Program staff distributes literature on solid waste awareness and recycling curricula. Other states and agencies such as the U.S. EPA, Keep America Beautiful, EcoGroup, Inc. and the Florida Department of Environmental Quality produced documents and manuals that include environmental and waste reduction information and can be acquired at no cost to ADEQ. This type of literature exchange between organizations is

encouraged in order to limit the extra production of the same type of guidance document.

The Arizona Recycling Program awarded a grant to the Environmental Education Exchange to create a computer software program for students in grades four through six. The software program, entitled " Mission 3R," is an entertaining hands-on program which encourages students to reduce the waste that they are generating, buy recycled products, recycle, and compost organic matter, while also testing the children on what they have learned. Approximately 800 schools received the first mailing of the Macintosh™ version in October 1996. This software program was forwarded at no cost to all elementary school libraries and public libraries in the state. The " Mission 3R" disks are intended to be checked out of the library by the teachers from each school and loaded onto their classroom computers. A teacher's guide is available on the disks, as well, to provide the teachers with guidance for the software program. Other classroom activities pertaining to solid waste awareness are included in the teacher's guide.

In August 1997, the Environmental Education Exchange created a PC version of the " Mission 3R" software program to distribute to those schools that have IBM™ computers. Approximately 750 copies of this version were distributed to schools and through individual requests. A complimentary color brochure was also produced that described the software program and containing examples of the what the computer game looks like on the screen. To enhance this valuable education project, the Arizona Recycling Program began working with the Environmental Education Exchange, in June 1998, to

upgrade the technical animation and audio segments the entire program. Completion of the CD-ROM disk is planned for May 1999.

The University of Arizona's Cooperative Extension developed the Master Composter's Training Course several years ago, and the training has continued to be utilized as a worthy professional development workshop. The Arizona Recycling Program supports the Cooperative Extension offices throughout Arizona by recommending the training to the interested parties as useful training for professional development and general public for home composting guidance as well.

The National Environmental Training Center sponsored the " Economics and Marketing of Recyclables for Recycling Coordinators" course in June 1998, at the Sedona Recycles Facility. The Southwest Public Recycling Association coordinated the training and manual is available at the ADEQ Recycling Program office and is recommended to Recycling Coordinators throughout the state.

The Recycling Program continues to coordinate activities and work cooperatively on environmental education projects with the Department of Education, the State Board of Education, non-profit education foundations, and private sector organizations.

VII. RECYLING MARKET DEVELOPMENT

The Arizona Recycling Program assists in the funding of the Arizona Department of Commerce's (ADOC) Recycling Market Development Program (A.S.R. §49-837.B.5.). The Recycling Market Development Program is designed to reduce waste and generate economic development in the state's fast growing environmental industry cluster. ADOC's Recycling Market Development Program specifically works with public and private entities to create jobs and encourage investment. This is achieved through coordinating business recruitment and expansion programs for companies using post consumer materials, encouraging manufactures to use recovered and secondary materials, and promoting a positive business climate for the recycling industry.

A. Arizona Market Development Program Background

In 1993, the Arizona State Legislature adopted the Arizona Environmental Technology Bill (A.S.R §41-1514.02.) creating the Environmental Technology Office while providing significant tax benefits to large recycling manufactures that committed to an Arizona location through mid-1996. In 1994, ADOC was awarded a "Jobs Through Recycling" (JTR) grant from the EPA to assist economic development through recycling. One key product of this award was a partnership between the EPA, ADEQ, and the Recycling Market Development Program to jointly support the funding for the 1996 Arizona Market Development Study. This study provided baseline information to assist in the attraction of key recycling industries and assist existing operations expand in Arizona.
Based on Arizona's success, the Recycling Market Development Program applied for and received a second JTR Grant from the EPA in 1996. Through this funding, the program emphasis was shifted somewhat from general recruitment to targeted, sustainable industry development in rural and economically depressed areas of the state. Despite this shift, the program continued to attract large investments in recycling manufacturing in metropolitan and rural areas.

In November 1997, the Recycling Market Development Program received its third JTR Grant from the EPA. The project "Rural Recycling Business Initiative" will build on Arizona's solid market development background and JTR foundation tools to establish sustainable recycling businesses in rural and tribal areas of the state. Specific development tools will include geographic information databases, on-line and printed media that will efficiently identify and link regional waste streams, eco-industry sites, producers, consumers, and suppliers of recycled products. Tools will be posted on the World Wide Web and marketed to assist local economic developers, attract new industries, and help to mentor similar efforts worldwide.

B. Recycling Marketing Results

1. Activity Sponsorship

The Recycling Market Development Program managed and co-sponsored with ADEQ the Second Annual Arizona Buy Recycled Expo. The Expo was held November 18-19, 1997, in Scottsdale. Three hundred attendees made this event an overwhelming success. This year's event, like last year's, was tailored to attract professional purchasing managers and inform them of Arizona made recycled products. Produced by the non-profit group Arizona Clean & Beautiful, the '97 Expo was held in conjunction with the annual Governor's Pride in Arizona awards. The event included over a dozen workshops, more than 30 product display booths, and strong interaction between the governor's awards attendees, the recycling community, the media, and general business public. The Recycling Market Development Program and ADEQ anticipates co-sponsoring this event annually as a key component of the market development program.

With joint funding from the EPA, the Recycling Market Development Program, and the U.S. Forest Service, a forestry project was established to look at the potential use of small diameter ponderosa pine as a feed stock in new economic development activities in the rural northern part of the state. The partnerships of environmental organizations, industry, and economic developers are continuing to meet in order to discuss concerns and craft working eco-industry plans. The USDA Little Colorado Resource and Conservation District and ADOC, will continue to guide this effort through the project's steering committee; the Sustainable Forest Partnership. Presently two firms, Forest Energy in Show Low and Precision Pine in Heber, are exploring production of waste timber items such as stove pellets and kitty litter.

2. Marketing Tools/Outreach

The Recycling Market Development Program worked in conjunction with ADEQ to survey existing collectors, processors, and end users of recycled feedstock streams to update the recycling database. This information will allow the two agencies to accurately assess the status of recycling and inform prospective clients of that status. The Program also created a marketing brochure to be used for trade shows and direct mail campaigns.

The Recycling Market Development Program performed many outreach functions during the 1998 Fiscal Year. It presented information on Arizona's recycling market development program at several national and regional conferences, including the fall conference of the Arizona Association of Economic Developers, ADEQ's Waste Prevention and Minimization seminar, and the BioCycle conference. The program also visited numerous local communities, both metropolitan and rural, and tribal nations to educate local governments' economic developers and community members on programs offered by ADOC.

3. Administration

During the FY 98, the Recycling Market Development Program continued to coordinate objectives between the EPA, ADEQ, and ADOC. The program completed and submitted the final report on the 1996 JTR Grant which it received, and wrote the 1998 JTR Grant proposal for the "Rural Recycling Business Initiative" project. The 1998 JTR Grant was awarded funding of $80,000 in September 1998.

4. Businesses Development/Assistance

The Recycling Market Development Program assisted 10 companies with their Arizona site location, expansion, and/or start-up operations. This assistance came in the form of monetary assistance, technical guidance, and tax credits. This direct assistance will establish 466 new Arizona based recycling jobs with in three years, and attracted $57,150,000 in new recycling business investment. These new or expanding recycling businesses will divert an estimated 412,233 tons of waste material from regional landfills each year, with the key commodities diverted being scrap steel, old corrugated containers, mixed paper, plastic, copper, and other recyclable fibers. These ten companies were:

LB International - A four-year-old company from Colorado that produces low emission heating and camping logs from recycled newspaper and agricultural waste. The firm will establish a plant on a 300 acre abandoned timber mill site in Fredonia, AZ. The products, known as Eco-logs, can replace traditional fireplace logs and high-polluting combustibles used for heat throughout the world.

Edwards Paper Company - A successful family-managed tissue mill has chosen to locate in Tucson.

Royal Woods Home Products - Royal woods will be recycling reclaimed sawdust and mixing it with plastic resin to make lumber like products. The company will also be recycling its waste plastic back into the extrusion process.

Xenatech - Xenatech will be assisting in closing the loop of the copper wire recycling process in Arizona. The company will be supplying clean wire to Gould, a large copper recycler located in Chandler, AZ.

USA CRINC - This company located a plant in Phoenix, and is currently serving as the city of Tempe's recycling material recycling facility contractor. USA CRINC is based in Massachusetts, and the Phoenix plant represents the first Southwest location for this reputable firm. The new Phoenix operation employs over 50 people.

ACF Services (Enviro Sand) - This Scottsdale-based company will manufacture 50 different products from micro-ground recycled glass. The products include architectural tile, fiberglass beads, plastic filler, and filter medium. These products were prominently displayed at the second annual Arizona Buy Recycled Expo. Uniquely, ACF will offer a

mobile glass crushing service. The city of Scottsdale is assisting the firm in leasing land.

Container Recycling Alliance (CRA) - A large glass recycling company that has been shipping recycled container glass from Arizona to California for reprocessing into wine and beverage bottles. A new plant in west Phoenix will enable CRA to crush glass on site; thus increasing shipping efficiency and providing a steady Arizona market for recycled glass.

Gentle Rain Designs - A new Hopi-run operation manufactures recycled canvas purses and wallets along with eco-spun Hopi designed fleece from PET bottles from home sewing sites on the Hopi Nation. This project was funded in part by the EPA with matching funds provided by the Recycling Market Development Program.

North Star Steel - Already the Southwest's largest steel recycling mini-mill, Kingman-based North Star Steel has doubled employment to nearly 300 jobs since their opening three years ago. North Star Steel has added a new production line that is forging wire out of recycled metal, while continuing to produce rebar. The ADOC Technology program provided major tax incentives to attract North Star Steel to the state. Recyclers throughout Arizona and the region are expanding to meet North Star Steel's demand for over 250,000 tons per year of scrap steel.

US Fiber - A major national insulation firm has opened a plant to utilize recycled newspaper in the manufacture of bulk insulation. The firm has retrofitted a 30,000 square foot industrial building in West Phoenix to serve as their plant headquarters. US Fiber will employ 30 people.

5. On-going Projects

The upcoming fiscal year includes many ADOC and ADOC/ADEQ sponsored programs and a new work plan for the 1998 EPA JTR grant. The Recycling Market Development Program currently has 67 active client/prospects interested in potential business expansions and relocations. In addition, the following projects were budgeted for the 1999 fiscal year:

Arizona "Buy Recycled Expo" - The third Arizona "Buy Recycled Expo" is planned for November 1998. As with the previous year's event, the expo will highlight products made or distributed in Arizona that have recycled content materials and to encourage Arizona's public and private purchasing managers to close the loop and buy recycled.

Rural Recycling Business Initiative - Many rural communities are now looking to the ADOC for individual recycling market development assistance. This individual attention is often difficult to provide in a fair manner over widespread rural areas of the state. Further, some individual rural communities lack the resources to attract recycling industry, and are often unaware of suitable waste streams in their own regions which could be used as feedstock. In an effort to address these issues in a widespread and strategic fashion,

Arizona's 1998 JTR grant award will establish an online database and hyperactive mapping system that will allow local waste streams, infrastructure, market access, and labor pools to be matched to business needs through on-line data profiles. Existing collection sites, processors, and end-users along with community resources will also be listed in order to facilitate the successful location of recycling industries in specified rural and tribal areas. The Internet will serve as a data base venue serving as a virtual marketing tool and mentoring medium for unlimited access by interested communities, peer organizations, and prospects/clients.

VIII. USED OIL RECOMMENDATIONS

The Annual Report is required by A.R.S. §49-832.C. to include recommendations on the feasibility of maximizing the use of: a) re-refined oil for state lubrication oil needs[49], and b) the state's use of used oil as the oil feedstock to re-refiners.

A. Use of Used Oil for the State's Lubrication Oil Needs

As was first reported in the 1996 annual report, automobile warranties do not prohibit the use of re-refined (recycled) oil for engine lubrication. Auto manufacturers and the oil industry do not distinguish between re-refined oil and virgin oil. Many brands of lubricating oil are sold in containers that indicate a portion of the oil is re-refined by displaying the recycled content symbol. However, as there is no recognized distinction between re-refined and virgin oil, re-refined oil may be purchased in a container that does not identify its contents as re-refined.

Guidelines set by the American Automobile Manufacturers Association, the American Petroleum Institute, the Society of Automobile Engineers, the American Society of Testing Materials, and the Chemical Manufacturers Association do not distinguish between re-refined oils and virgin oils. In addition, all three major United States automobile manufacturers (Ford, General Motors, and Chrysler) recognize that re-refined oils meet the performance criteria specified in their warranties. However, neither all re-refined nor virgin oils meet these industry standards. Engine oils must be licensed indicating that they meet the current American Petroleum Institute (API) designations to guarantee performance and a valid warranty. Consumers must look for the API donut or the starburst symbol on the oil container to be sure the oil they are purchasing meets warranty standards.

Though foreign auto makers as a group have not officially announced they recognize the use of re-refined oil for lubricating needs in their products, foreign manufactures do not prohibit its use. In fact, Mercedes Benz installs re-refined oil in every new car manufactured in Germany and South Carolina. Concerned consumers may wish to make inquiries to individual foreign auto makers to allay uncertainties.

The cost of re-refined oil has become competitive with virgin oil. In 1994, the U.S. Postal Service used re-refined oil in 105,600 vehicles and saved up to five cents per gallon. Re-refined oil now exists that meets the warranty requirements of automobile manufacturers and has become competitive in price with virgin oils. The Arizona Recycling Program encourages the continued use of American Petroleum Institute licensed re-refined oil as a lubricant in the state's fleet vehicles and its use by the public at large.

[49]The information contained in this section was obtained from Re-Refined Oil; the Buy Recycled Business Alliance, 1996.

B. The Use of This State's Used Oil as a Feedstock to Re-refiners

Annual reports submitted to ADEQ's Solid Waste Section from the used oil industry in Arizona indicate that 14,032,682 gallons of used oil were collected during the 1997 Calendar Year. This is 5.1 percent greater than the year before. It is not known, nor can it be determined, whether the increase in the amount of oil collected was the result of an increase in the amount of oil used, or the more conscientious disposal of used oil by Arizona citizens. Table 8.1 gives the breakdown of the uses of the recovered used oil.

The industry re-used 6,973,725 gallons of used oil in Arizona. The majority of this, 6,770,741 gallons, was burned in asphalt production and energy recovery. The remaining 202,984 gallons was recycled as form oil. This means that 1.4% of the oil collected in Arizona was recycled within the state. The used oil industry in Arizona exported 7,058,957 gallons of used oil to Alabama, California, Colorado, Indiana, Nevada, New Mexico, and Texas. Burning, including the use as bunker fuel, accounted for 4,565,458 gallons, while 2,382,681 gallons were recycled as lubrication stock, form oil[50], or re-refined. A total of 2,585,665 gallons of the used oil collected from sources in Arizona was recycled. This represents a recycling rate of 18.4 percent.

Use	Arizona	Alabama	California	Indiana	Nevada	New Mexico	Texas	Total
Recycled Total	202,984	159,610	810,804	1,412,267				**2,585,665**
Lube Stock			810,804	1,412,267				**2,223,071**
Re-refiners		159,610						**159,610**
Form Oil	202,984							**202,984**
Diverted Total	**6,770,741**		**1,180,784**		**317,764**	**622,866**	**2,554,862**	**11,447,017**
Burned	6,770,741				317,764	622,866		**7,711,371**
Bunker Fuel			1,180,784				2,554,862	**3,735,646**
Total	**6,973,725**	**159,610**	**1,991,588**	**1,412,267**	**317,764**	**622,866**	**2,554,862**	**14,032,682**

Table 8.1: Uses of used oil collected within Arizona during the 1997 calendar year. Figures recorded are in gallons.

The 18.4 percent recycling rate for used oil is a significant increase over the amount recycled in 1996, 8.5 percent. This is a result of more form oil being produced in Arizona and large increases in the amount of oil exported to Alabama, California, and Indiana to be re-refined or used a lubrication stock. The 18.4 percent used oil recycling rate for Arizona should be very close to the national average, which was 15 percent in 1995. Though the amount of used oil recycled in the state increased by over 200 percent during

[50]Form oil is used to coat the inside surfaces of forms, molds, and used to shape concrete structures in the construction industry. The oil lubricates the inside surface allowing the forms to be removed easily once the concrete has hardened.

the past year, 98.6 percent of the possible feed stock for re-refined used oil is not being utilized by recycling industries within the state. This represents a significant loss of revenue in the form of value added to the material in its re-refined state. The Arizona Recycling Program encourages the development of the oil re-refining industry within Arizona. This would supply jobs and revenue for the state, while further increasing the used oil recycling rate.

IX. RECYCLING OPPORTUNITIES, IMPEDIMENTS, AND DISINCENTIVES

The Arizona Solid Waste Recycling Act of 1990 (A.R.S. §49-832.C.6.) requires that recycling opportunities, impediments, and disincentives be reported annually. This section will relate the most common of these mentioned by respondents to the Fiscal Year 1998 Annual Waste Reduction and Recycling Questionnaire. Opportunities, which will be discussed first, may be useful to communities considering the implementation of a recycling program. The impediments and disincentives are closely monitored by the Arizona Recycling Program staff to direct resources toward problems which inhibit the growth of recycling in the state. It is important to note that this information is subjective and reflects the opinions and experiences of the respondents.

A. Opportunities that Encourage Recycling

The most identified opportunities for recycling were: 1) existing programs, 2) community involvement and support, 3) financial benefits, and 4) convenience and simplicity. A complete list of the stated opportunities and incentives, along with the reporting jurisdictions, is provided in Table 9.1.

1. Existing Program Opportunities

The most frequently identified opportunity or incentive to recycle remained constant over the past four years. It is the availability of existing programs. Thirty-nine jurisdictions identified this issue. Programs have been divided into two categories: 1) the program type and 2) the type of organization offering the program. Jurisdictions stated that drop-off sites, composting/seasonal treecycling, curbside pick-up, household hazardous waste collection, and scrap metal/white goods collection programs provided the greatest opportunity to their community to recycle. Although this was the most cited opportunity, there are more jurisdictions that have existing programs than those that sited this as an opportunity. This discrepancy was mostly accounted for in the areas of treecycling and drop-off programs.

2. Community Involvement/Support

The second most frequently identified opportunity or incentive to recycle was community involvement and support. Again, this remained consistent for the past four years. It seems that the factors that are identified in community involvement are closely affected by one another. A positive attitude toward recycling proves the largest factor for community involvement and support. In some communities, the immigration of citizens from the eastern part of the United States, or from communities that already have recycling programs, increased the desire to recycle and begin recycling programs. The strong support of city governments also seems to have a great affect on the attitudes toward, and participation in, recycling programs.

Table 9.1 Opportunities and incentives to recycle in Arizona as identified by local jurisdictions within the state. The number of jurisdictions identifying each opportunity is given in the middle column. The jurisdictions identifying the opportunity are given in the right column. Subcategories are given if several jurisdictions identify similar opportunities or incentive.

Opportunity or Incentive	Number	Jurisdictions
Existing Programs	**39**	
Program Type		
Drop-off Programs	10	Clarkdale, Cottonwood, Glendale, Graham County, Mesa, Navajo County, Payson, Sahuarita , Sierra Vista, Tucson
Composting/Treecycle Programs	6	Mesa, Parker, San Luis, Scottsdale, Sierra Vista, Tucson
Curbside Programs	6	Carefree, Chandler, Clarkdale, Mesa, Scottsdale, Tucson
Household Hazardous Waste Collections	4	Pima County, Santa Cruz County, Scottsdale, Yuma County
Scrap Metal/White Goods Programs	4	Mesa, Parker, Scottsdale, Sierra Vista
Move-in Box Recycling	1	Scottsdale
Multi-unit Recycling Programs	1	Mesa
Offering Organizations		
Private Companies	5	Carefree, El Mirage, Graham County, Navajo County, Payson
Non-Profit Organizations	2	Navajo County, Clarkdale
Community Involvement/Support	**20**	
Positive Attitude Toward Recycling	5	Coconino County, Goodyear, Lake Havasu City, Page, Sedona
Imported Recycling Habits	4	Goodyear, Page, Pinal County, Sedona
Strong Support by City Government	4	Chandler, Lake Havasu City, Tucson, Sedona
Individual Effort/Participation	3	Chandler, Tucson, Sedona
Volunteerism/Community Events	2	Chandler, Sedona
Citizen Task Force	1	Cochise County
Environmentally Aware Citizens	1	Sierra Vista
Financial Benefits	**10**	
Received Grant Money	3	Cochise County, Cottonwood, Tucson
Low/No Cost to Customers	3	Carefree, Casa Grande, Sierra Vista
Schools Get Paid for Materials	2	Glendale, Peoria
Rising Tipping Fees at Landfills	1	Sierra Vista
Commercial Rates for Recycling Bins	1	Mesa
Convenience/Simplicity	**7**	Chandler, Clarkdale, Coconino County, Flagstaff, Scottsdale, Sedona, Sierra Vista
Educational/Awareness Programs	**6**	Chandler, Cottonwood, Cochise County, Flagstaff, Mesa, Tucson
Cooperation and Partnerships	**3**	Coconino County, Pinal County, Sierra Vista
Other Opportunities or Incentives		
Expansion of Programs	2	Mesa, Tucson
Concentrated Population	1	Graham County
Location of Transportation	1	Coconino County
Increased Development	1	Pinal County
Neighboring Community with Recycling	1	Clarkdale
Lack of Private Service Offered	1	Cottonwood
Creative with Limited Resources	1	Flagstaff

3. Financial Benefits

The financial benefits of recycling remained the third most identified incentive to recycle. The availability of grant funds from the State Recycling Program and other sources is now being identified as an opportunity to start recycling programs. This fiscal year, three jurisdictions reported having received grant funding directed toward their recycling program. Cochise County and the city of Cottonwood both stated that the grants they received from the State Recycling Program were an incentive for their jurisdiction to recycle (see Section V). This indicates that the Waste Reduction Assistance and Waste Reduction Initiative Through Education Grant programs are accomplishing their goals. The City of Tucson received a federal grant from the U.S. Environmental Protection Agency for bilingual education materials. A few jurisdictions stated that the decreased cost charged to the community was an incentive, and some jurisdictions regenerated the revenues from recycling to the schools that collected the recyclable materials, thus increasing the incentive.

4. Convenience and Simplicity

For the first time, jurisdictions reported convenience and simplicity as a major opportunity or incentive to recycle. Although there were fewer responses to this category this year than last, it is still helpful to understand that if a program is accessible to the community in a simple and convenient way, then the community will be more receptive to participation in that program. One jurisdiction stated that " convenience is always important, but [their recycling program] is built on community support." Many other jurisdictions agreed. This supports the idea that even though programs can be developed that are convenient, it still takes education, community support, and other factors to make a truly successful recycling program.

B. Impediments and Disincentives to Recycling

The impediments and disincentives fall into four main categories. These categories are: 1) financial, 2) community attitudes and education, 3) lack of jurisdictional staff, and 4) infrastructure and logistics. Financial concerns are, by far, the most frequently identified impediments to recycling. A complete list of the impediments and disincentives, along with the reporting jurisdictions, is given in Table 9.2.

Table 9.2 Impediments and disincentives to recycling in Arizona as identified by local jurisdictions within the state. The number of jurisdictions identifying each impediment is given in the middle column. The jurisdictions identifying the impediment are given in the right column. Subcategories are given if several jurisdictions identify similar impediments or disincentive.

Impediment or Disincentive	Number	Jurisdictions
Financial	**53**	
Cost of Programs/Lack of Resources	17	Avondale, Chino Valley, El Mirage, Goodyear, Guadalupe, Holbrook, Lake Havasu City, Navajo County, Pima County, Pinal County, Sahuarita, Sedona, Snowflake, Somerton, Thatcher, Tolleson, Tucson
Location of Markets/Jurisdiction	8	Coconino County, Flagstaff, Florence, Holbrook, Mammoth, Navajo County, Page, Sierra Vista
Transportation Costs	7	La Paz County, Mesa, Navajo County, Page, Pima County, Sierra Vista, Snowflake
Community Size/Volume of Materials	5	Cave Creek, Coconino County, Graham County, Prescott, Sierra Vista
Prices/Market Fluctuations	5	Casa Grande, Holbrook, Mesa, Scottsdale, Sierra Vista
Little/No Revenue for Jurisdiction	4	Florence, Sedona, Sierra Vista, Snowflake
Increased Cost to Citizens	2	Avondale, Cottonwood
Competition with Private Haulers	1	Mesa
Efficient Utilization of Program	1	Scottsdale
Industry Mergers	1	Pima County
No Revenues for Citizens	1	Casa Grande
Recycling Free to Residents	1	Tucson
Community Attitudes/Education	**11**	Bullhead City, Coolidge, Flagstaff, Pinal County, Sahuarita, San Luis, Sedona, Thatcher, Tolleson, Williams, Yuma
Lack of Jurisdictional Staff	**9**	Cottonwood, El Mirage, Goodyear, Pinal County, Queen Creek, San Luis, Snowflake, Tolleson, Williams
Infrastructure and Logistical Problems	**2**	Nogales, Sierra Vista
Other Impediments or Disincentives		
Limited Amounts/Items Accepted	5	Gilbert, Mesa, Peoria, Pinal County, Sedona
Lack of Control	4	Cave Creek, Chandler, Clarkdale, Queen Creek
No Facilities	4	Coconino County, Thatcher, Tombstone, Yavapai County
Do Not Offer Recycling to All Citizens	2	Chandler, Mesa
No Multi-Jurisdictional Support	2	Payson, Mesa
Long Landfill Lifetime Expected	1	Tucson
Closure of Collection Site	1	St. Johns
Lack of Industrial Zoning	1	Cave Creek
Not Convenient	1	Sedona
No Separate Bins	1	Gila County
Past Failures	1	Nogales
Permit Requirements	1	Pima County
Recycling Not Mandated	1	Goodyear
Scavenging at Drop-off Bins	1	Nogales
Tourist Generated Waste	1	Coconino County

1. Financial Impediments

Financial impediments were identified by 53 jurisdictions as the greatest impediment. Although this is consistent with the results from the past three years, the number of jurisdictions reporting financial impediments increased from the 1997 FY. The top five financial concerns dealt with the economics of sustaining a recycling program. By far, the greatest impediment reported this fiscal year was the cost of programs and the lack of resources. Of the 17 respondents that reported cost and lack of resources as impediments, seven stated that they do not have community operated recycling programs. Transportation costs, location of markets, the location and size of the jurisdiction, and instability in the markets, consistently have been reported as the greatest impediments. These are all legitimate issues that are difficult to overcome due to the geography of Arizona, current locations of recycling processors and end-users, and the nature of recyclable materials markets.

2. Community Attitude and Education

Community attitudes and education were, again this year, reported as the second most common impediments or disincentives to recycle. This fiscal year, the number of jurisdictions reporting this as an impediment or disincentive, 11, was the highest that had been reported since the 1995 Fiscal Year. There is still reported apathy and lack of priority for recycling. However, it would seem as if with the increased community involvement/support and educational/awareness programs reported as incentives, efforts of many jurisdictions have had a positive influence on their communities' attitudes.

3. Lack of Jurisdictional Staff

Lack of jurisdictional staff was, for the second year in a row, identified as a major impediment to recycling. This was, again, reported primarily by smaller and mostly rural jurisdictions. The staff members of these jurisdictions usually do not have the time or resources available to them to provide adequate, if any, recycling programs to their communities. Although many jurisdictions reporting lack of jurisdictional staff as an impediment, six reported that they had opportunity or incentive to recycle in their jurisdiction. Cottonwood received a grant from the State Recycling Program to assist in the expansion of their drop-off recycling program (see Section V).

APPENDIX A

RECYCLING INFORMATION RESOURCES

To obtain copies of the resources listed below, you may call the Arizona Recycling Program at (602) 207-4133, or call toll free in Arizona at 1-800-234-5677, ext. 4133. You may also write to the Arizona Department of Environmental Quality, Recycling Program, T3011A, 3033 North Central Avenue, Phoenix, AZ 85012.

- Public Recycling Program Coordinators List
- Public Household Hazardous Waste Recycling Programs
- Residential Curbside Recycling Information on Programs Operating in Arizona since 1988
- Results of the 1996-1997 Christmas Tree Diversion Programs in the State of Arizona
- The Fiscal Year 1991 through 1998 State of Arizona Recycling Program Annual Report
- Annual Information on materials recycled by local jurisdictions since 1991 (In tons or cubic years)
- *The Arizona Recycling Review Newsletter,* Arizona State University. (selected Volumes, 1992-1998)
- " Mission 3R" Software Program, Environmental Education Exchange, October 1996. (available in Macintosh and PC Version)
- " Economics and Marketing of Recyclables for Small Communities, for Recycling Coordinators" , National Environmental Training Centers, Version 9702.
- " Inn-Keeping with the Environment: A Waste Reduction Guidebook for the Arizona Lodging Industry" , Arizona Hotel & Motel Association, May 1998.
- The U.S. Environmental Recycling Hotline's Official Promotional Video, Cleanup Inc., April 1998.
- " Arizona Small Business Reduce, Reuse, and Recycle Guide" , 1995 Version.
- " Source Reduction Program Potential Manual: A Planning Packet" , U.S.

Environmental Protection Agency, EPA530-R-97-002, September 1997.(Packet includes Source Reduction Program Potential Manual and ReduceIt software)

- " Measuring Recycling: A Guide for State and Local Governments" , U.S. Environmental Protection Agency, EPA530-R-97-011, September 1997.

- " Compost Resource Guidebook" , Organic Products Committee, of the Arizona Recycling Coalition, April 1998.

Appendix B

TONS OF WASTE DISPOSED AT SOLID WASTE LANDFILLS IN ARIZONA FROM APRIL 1997 THROUGH MARCH 1998 AS REPORTED TO ADEQ

NAME	TYPE[1]	COUNTY	OPERATION STATUS	TIPPING FEE[2]	TOTAL TONS LANDFILLED[3]
40th Street Landfill	CDLF	Maricopa	Inactive	Unknown	0.00
AEPCO - Apache Power Generating Station	ISWLF	Apache	Active	Unknown	141.12
Allied Waste - Apache Junction	MSWLF	Pinal	Active	$10.50/cu.yd	68,011.56
Allied Waste - Lake Havasu City	MSWLF	Mohave	Active	$10.00/cu.yd	54,654.00
Allied Waste - Southwest Regional	MSWLF	Maricopa	Active	$20.00/ton	200,674.32
Apache County - Blue Hills Regional	MSWLF	Apache	Active	$25.00/ton	41,996.80
Arizona Strip	MSWLF	Mohave	Active	Unknown	1,858.48
ASARCO Ray Complex - Hayden Concentrator	ISWLF	Pima	Active	Unknown	4,785.00
ASARCO Ray Complex - Hayden Smelter	ISWLF	Pima	Active	Unknown	4,608.32
ASARCO Ray Complex - Ray Mine	ISWLF	Pima	Active	Unknown	5,277.52
Arizona Prison/Fort Grant	MSWLF	Graham	Active	Unknown	840.00
BHP Copper - Superior	ISWLF	Pinal	Active	Unknown	20.00
Calmat - Litchfield/Avondale	CDLF	Maricopa	Active	Unknown	79,408.72
(City of) Casa Grande - Casa Grande	MSWLF	Pinal	Active	$12.00/ton	74,691.16
(City of) Chandler - McQueen	MSWLF	Maricopa	Active	$28.40/ton	82,762.68
Cochise County - Elfrida/Eastern Regional	MSWLF	Cochise	Active	$39.00/ton	60,976.56
Cocopah - Somerton - Yuma Billing	MSWLF	Yuma	Active	$10.99/ton	19,441.16
(City of) Colorado - Colorado City	MSWLF	Mohave	Active	Unknown	679.28
(City of) Eloy - Eloy	MSWLF	Pinal	Active	Unknown	14,216.68
(City of) Flagstaff - Cinder Lake	MSWLF	Coconino	Active	$30.25/ton	130,697.88
(Town of) Fredonia - Fredonia	MSWLF	Coconino	Closed		336.00
Gila County - Buckhead Mesa	MSWLF	Gila	Active	$22.00/ton	30,018.52
Gila County - Globe/Russell Gulch	MSWLF	Gila	Active	$22.00/ton	23,502.52
(City of) Glendale - Glendale	MSWLF	Maricopa	Active	$26.25/ton	252,307.80
Glenn Weinberger	CDLF	Maricopa	Active	Unknown	59,486.60
Grand Canyon South Rim National Park	MSWLF	Coconino	Active	No charge	2,391.24
Greenlee County - Blue	MSWLF	Greenlee	Active	No charge	224.00
Greenlee County - Loma Linda	MSWLF	Greenlee	Active	No charge	8,744.96

NAME	TYPE[1]	COUNTY	OPERATION STATUS	TIPPING FEE[2]	TOTAL TONS LANDFILLED[3]
Greenlee County - South County	MSWLF	Greenlee	Active	No charge	600.00
(City of) Holbrook - Holbrook South	MSWLF	Navajo	Inactive	Unknown	0.00
(City of) Huachuca City - Huachuca City	MSWLF	Cochise	Active	$35.00/ton	34,810.36
La Paz County	MSWLF	La Paz	Active	$20.00/ton	32,008.20
Maricopa County - Cave Creek	MSWLF	Maricopa	Active	$17.00/ton	106,377.00
Maricopa County - Hassayampa	MSWLF	Maricopa	Inactive		38,757.00
Maricopa County - Queen Creek	MSWLF	Maricopa	Active	$21.00/ton	150,019.24
Mohave County - Cerbat	MSWLF	Mohave	Active	$28.15/ton	43,789.96
Mohave County - Mohave Valley	MSWLF	Mohave	Active	$26.15/ton	54,171.60
(City of) Page - Page	MSWLF	Coconino	Inactive	$3.00/cu.yd	0.00
(Town of) Patagonia - Patagonia	MSWLF	Santa Cruz	Active	$5.00/cu.yd	994.56
(City of) Phoenix - Skunk Creek	MSWLF	Maricopa	Active	$22.25/ton	680,091.40
Pima County - Ajo	MSWLF	Pima	Active	$23.50/ton	3,321.92
Pima County - Ina Road	MSWLF	Pima	Active	Unknown	20,072.40
Pima County - Sahuarita	MSWLF	Pima	Active	Unknown	29,197.04
Pima County - Tangerine Road	MSWLF	Pima	Active	$23.50/ton	87,216.44
(City of) Prescott - Sundog Ranch Road	MSWLF	Yavapai	Inactive	$50.00/ton	3,474.40
Resource Recovery Trust - Speedway	CDLF	Pima	Active	Unknown	41,354.00
Salt River Indian Tribe - Gilbert Billing	MSWLF	Maricopa	Active	$27.00/ton	48,207.00
Salt River Indian Tribe - Mesa Billing	MSWLF	Maricopa	Active	$27.00/ton	203,839.92
(City of) Safford - Safford	MSWLF	Graham	Active	No charge	16,303.12
Santa Cruz County - Rio Rico	MSWLF	Santa Cruz	Active	$23.00/ton	39,805.00
Santa Cruz County - Sonoita/Elgin	MSWLF	Santa Cruz	Active	$23.00/ton	1,144.00
Springerville Generating Station	ISWLF	Apache	Inactive	Unknown	0.00
SRP - Coronado Generating Station	ISWLF	Apache	Active	Unknown	0.00
Stone Container - Snowflake	ISWFL	Navajo	Active	Unknown	249,370.00
(City of) Tucson - Harrison Road	MSWLF	Pima	Inactive	Unknown	0.00
(City of) Tucson - Los Reales	MSWLF	Pima	Active	$22.00/ton	466,705.80
Waste Management - Adamsville	MSWLF	Pinal	Active	$6.50/cu.yd	61,600.00
Waste Management - Butterfield Station	MSWLF	Maricopa	Active	$16.25/ton	1,010,843.56
Waste Management - Copper Mountain	MSWLF	Yuma	Active	$10.99/ton	231,579.96
Waste Management - Dudleyville	MSWLF	Pinal	Active	$6.50/cu.yd	31,061.52
Waste Management - Grey Wolf	MSWLF	Yavapai	Active	$27.74/ton	144,092.96

NAME	TYPE[1]	COUNTY	OPERATION STATUS	TIPPING FEE[2]	TOTAL TONS LANDFILLED[3]
Waste Management - Lone Cactus	CDLF	Maricopa	Active	$23.25/ton	197,233.28
Waste Management - Northwest Regional	MSWLF	Maricopa	Active	$19.50/ton	283,308.12
Waste Management - Pen Rob	MSWLF	Navajo	Active	$5.50/cu.yd	92,492.96
Waste Management - Sierra Estrella	MSWLF	Pinal	Active	$16.25/ton	132,129.32
(Town of) Wickenburg - Wickenburg	MSWLF	Maricopa	Inactive	No charge	2,528.40
Yavapai County - Black Canyon	MSWLF	Yavapai	Inactive	$50.00/ton	757.12
Yavapai County - Camp Verde	MSWLF	Yavapai	Inactive	Unknown	0.00
Yavapai County - Seligman	MSWLF	Yavapai	Active	$50.00/ton	395.40
Total					**5,762,405.84**

1. MSWLF represents municipal solid waste landfill; CDLF represents construction debris landfill; ISWLF represents industrial solid waste landfill.

2. Tipping fee figures are from *Solid Waste Digest: Western Edition*; Chartwell Information Publishers, Volume 8, number 6, June 1998.

3. Tonnage was determined using payments received from landfill owners of $0.25/ton. Missing payments were estimated by comparing payments from other quarters of FY 1998 to payments from equivalent quarters from past years.